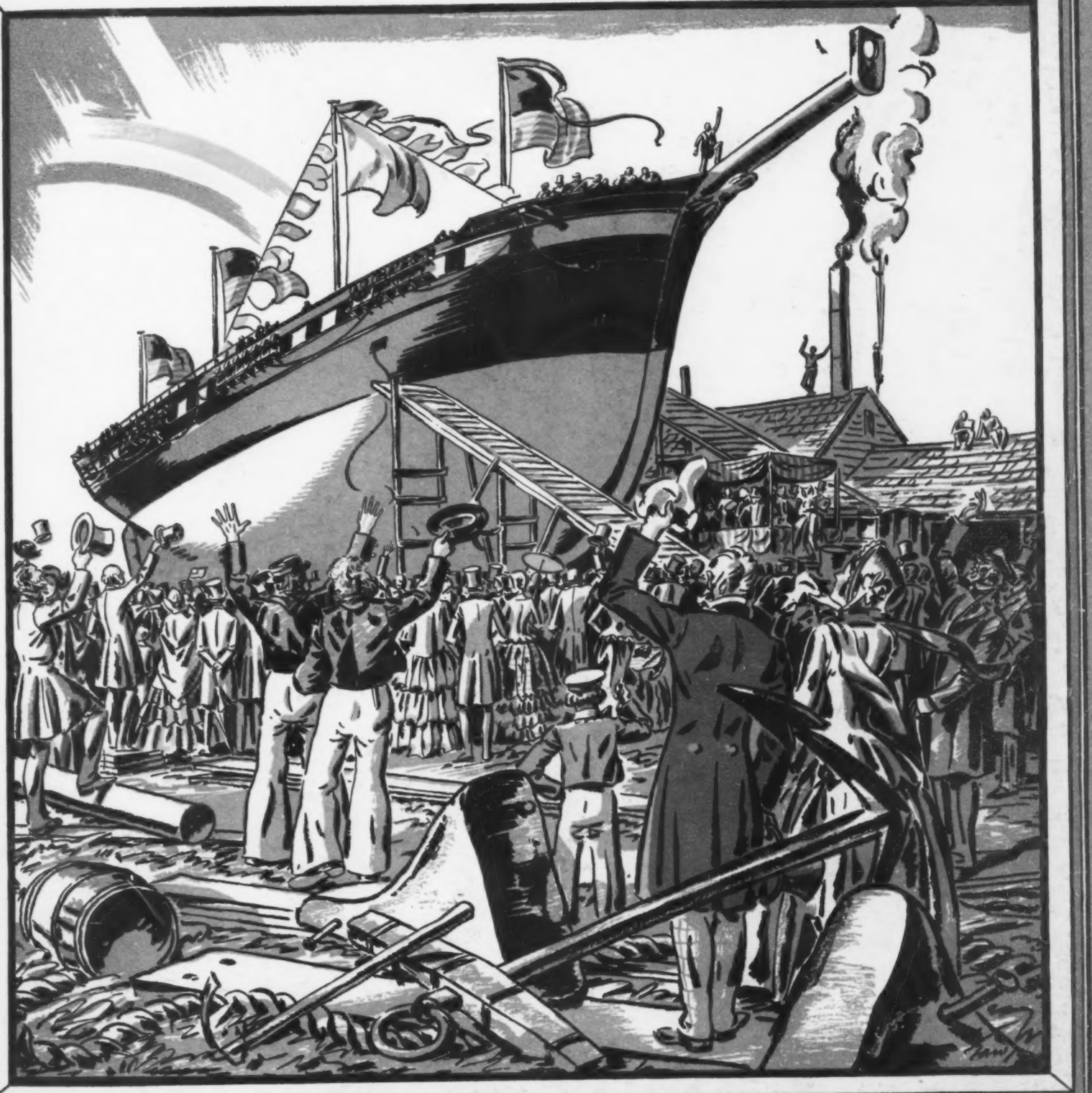
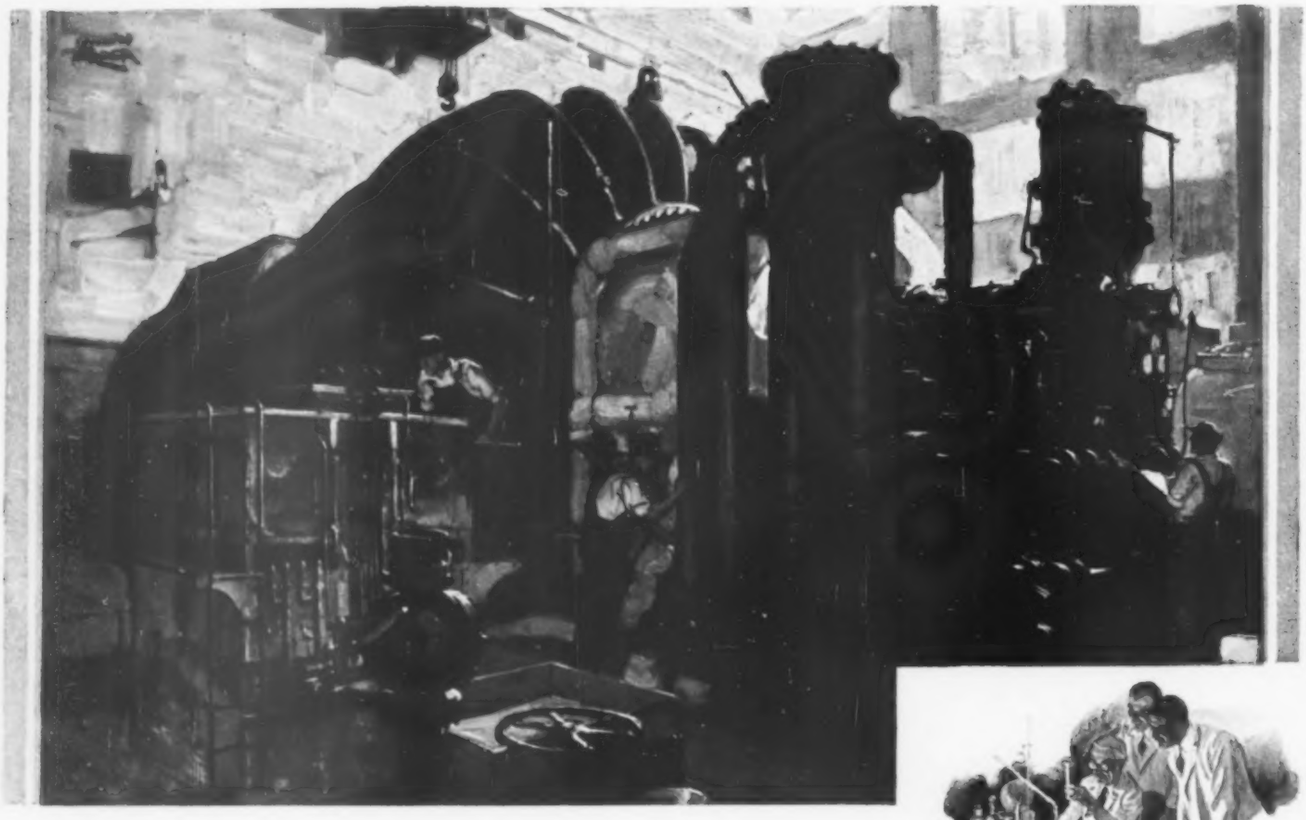
Fortune

One Dollar a Copy APRIL 1930 Ten Dollars a Year



Tiny Wheels, Giant Turbines Run Smoother on TEXACO



IN every branch of industry, in the nation's steel mills, mines and manufacturing plants there are power plants—high-speed, time and labor saving machines whose very life is dependent on oil!

Texaco Lubricants plus Texaco Lubrication Service have gone hand in hand to save millions for the industries of the world. There is no industrial lubricating problem too complicated for Texaco; there is no type of machinery made, from the sewing machine in the home to the giant turbine generating power for the electrical needs of an entire city, which is not being lubricated effectively by Texaco.

There is a Texaco Lubricant for *every* purpose. Throughout the world—everywhere the Texaco Red Star with the Green T is known and respected.

THE TEXAS COMPANY

Refiners of a complete line of Texaco Petroleum Products including Gasoline, Motor Oil, Industrial Lubricants, Railroad and Marine Lubricants, Farm Lubricants, Road Asphalts and Asphalt Roofing.

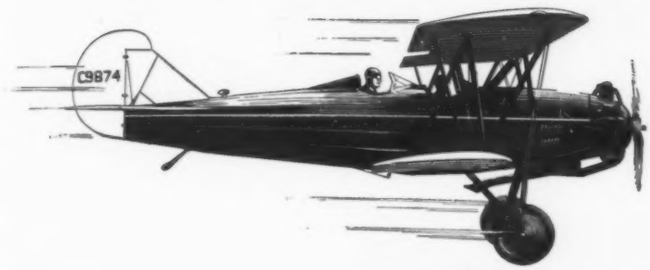
RESEARCH . . . THE GUIDE TO PROGRESS

Anticipating every development; insuring ever higher standards of quality . . . Texaco Laboratories are the source of Texaco progress.

TEXACO

TEXACO

The mark of quality for petroleum products



Dad's First Flight

I CIRCLED the house before settling the Travel Air on the lower lawn and as usual, Dad watched from the steps.

Once down, Gwen sprang out without my help. "Dad's always on hand, isn't he?" she asked as we walked toward him.

"Never misses a take-off or landing," I answered, "even though I've ceased to be a novelty to everyone else."

Gwen's next question was simple enough, but it stopped me. When she asked, "Has he ever been up?" what could I say? Neighbors, schoolmates, even the gardener had been passengers. But Dad, never. He didn't seem the type. But I've found you can't predict just who is going to be sky ambitious and who isn't.

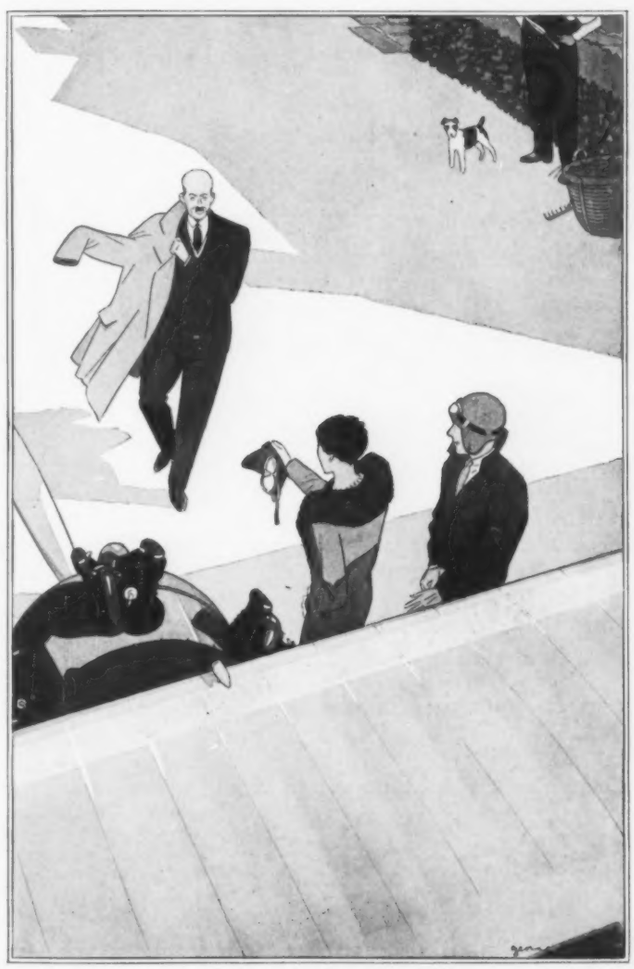
"Dad," I said, when we approached, "Isn't it about time you and I went up to look at a few silver linings?"

"Well, son," he smiled, "if you hadn't invited me I was just about to take her off the ground myself."

We lost no time. Gwen's helmet and an overcoat were his flying clothes. We were over the elms in a twinkling. Dad was having the time of his life. Whenever I looked around he wore the same rapt expression. I took my hands from the controls—held them over my head to show the plane's automatic stability. Then back we came to the lawn in a slow glide. Dad's face was all aglow. "Wonderful experience," he said, "Never felt so big or so small before."

And he keeps getting keener! Air minded? He's positively air hungry. Why, this afternoon after we flew from the club, he said, "Say, don't you think it would be sportier if we changed the 165 engine to a 225?"

Sportsmen penetrate the wilds in their Travel Airs. In commercial flying, Travel Airs daily ply their way over mail, transport and business corporation routes. They constitute a major proportion of all commercial planes in service in the United States. And in distance and speed contests these planes capture firsts with a regularity that is almost monotonous. Full particulars about Travel Air ships, their construction and performance for commercial, industrial and private flying, will be gladly sent you. Write Department T-1.



The Travel Air open cockpit biplane is Wright Whirlwind powered at either 165 or 225 H. P.; High speed, 165 H. P. Engine, 122 m. p. h.—High speed, 225 H. P. Engine, 132 m.p.h. Every Travel Air Airplane is entitled to full Curtiss-Wright day and night service at more than 40 bases throughout the continent

TRAVEL AIR COMPANY
Division of CURTISS-WRIGHT
Sales Offices: 27 West 57th Street, New York

A PLANE FOR EVERY PURPOSE

TRAVEL AIR

Establish a set of rules. Say, "Business must be run this way." Then sit back and watch some newcomer to big business, a man who possesses energy and imagination, cast your rules to the winds, win spectacular success and create a new fortune. This very thing has happened countless times

. . there is no one formula for fortune

And there is no single formula for effective advertising—faithful ally of modern industry. The most successful campaigns often result from a complete disregard of established precedent. Again, imagination plays the leading role—imagination governed by good business judgment and a thorough groundwork of advertising fundamentals. That is why the executives of the Campbell-Ewald Company do not attempt to apply any one method or formula to all advertising problems. It is their belief that the best advertising can be produced only through specialized knowledge of the individual case, and intelligent application of the principles of advertising by men who have both imagination and experience. The soundness of this practice is best illustrated by careful study of the type of advertising which is helping to build success for clients of the Campbell-Ewald Company.

CAMPBELL-EWALD COMPANY
advertising well directed H. T. Ewald, President . . Offices in Detroit, New York, Chicago, Seattle, Los Angeles, Portland, San Francisco, Paris, France; Sydney, Australia; In Canada—Campbell-Ewald Limited; Toronto, Montreal.

FORTUNE is published monthly by TIME, INC., at 205 E. 42nd St., New York, N. Y. Application for entry as second-class matter is pending. Subscription rates: One year in the U. S. and possessions, $10; Canada, $10.50; elsewhere, $11.

IMAGINATIONS QUICKEN

IN THE MEN WHO LOOK UPON THIS SCENE

ALWAYS IT'S BEEN SO ... AND ALWAYS IT WILL BE.....

Year after year, since the first golden nugget was found, men have come out of the east and the north and the south to test the promise of the Golden West ... to learn the secret of its city by the Golden Gate.

Month after month new thousands are coming; some for the simple pleasure that living here holds, others—alert, seeing the future—bent on its fair reward ...

And the city foreseen by those first men is the city San Francisco has come to be. Close beneath her fabled hills a fascinating harbor has grown to rank second in the United States in value of waterborne tonnage. Three great transcontinental railroads compete to serve her people . . . and 11,000,000 people living west of the Rocky Mountains, who are served from San Francisco more quickly and cheaply than from any other city. San Francisco centers the most concentrated population in the West. (Half the people of California live within a radius of one hundred and fifty miles). Situated in the midst of unlimited natural resources, it is not astonishing that this city should be headquarters for the leading financial, railroad, shipping, lumber, manufacturing and distributing interests of the whole Pacific Coast.

But imaginations quicken in the men who work and play in California's sun. 900,000,000 people in the lands bordering the Pacific are fast developing new, modern desires and San Francisco is the natural gateway for the commerce that will go to satisfy these wants. As surely as it leads the West today, this city's leadership will be extended in the great Pacific Era that is coming.

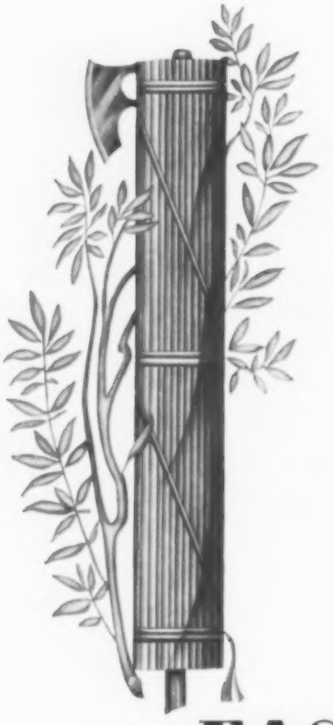
Plan now to spend this year's vacation in the brilliant out-door-land that San Francisco centers. You'll find a choice of half a hundred famous places, high in quiet mountains or down beside the sea —and always, this thought-provoking city close at hand.

Californians Inc. want to tell you more about San Francisco and the California that it centers—where thousands who come to visit, return again to live! Send your name and address for two worth-while illustrated books: "Why Manufacturers Choose San Francisco" and "California Vacations."

Address Californians Inc., Department 2204, 703 Market Street, San Francisco.

SAN FRANCISCO

IN CALIFORNIA—"WHERE LIFE IS BETTER"



FASCISTI ALL!

The bundle of rods which is on the United States ten cent piece; the red strapped fasces that lay over the left shoulder of the Roman Lictor; the name of the Italian Fascisti—all these signs and names say strength is in union. You can break a stick—but not a bundle of sticks. This is the kind of strength acquired by an advertising agency of many offices, of many experienced men and women, of many accounts widely diversified. It is a strength of unified judgment, emanating from long and world-wide business experience.

THE H · K · McCann Company

ADVERTISING

NEW YORK	CLEVELAND	CHICAGO	SAN FRANCISCO
DENVER	SEATTLE	LOS ANGELES	TORONTO
MONTREAL	LONDON	PARIS	FRANKFORT, o. M.

ENDURANCE

JUST as the Camel is the only animal to withstand the gruelling travel through desert heat, day-after-day, over burning sands beneath a blistering sun, so is the Firestone Supreme Balloon the one tire which has demonstrated its outstanding endurance in conquering adverse conditions on all kinds of roads, in all kinds of weather on all makes of cars. + The extra tough and thick safety tread, the extra strong cord construction, Gum-Dipped by the Firestone exclusive process which insulates every fiber of every cord against heat and friction, greatest enemies of long tire life—combine to insure tire performance beyond anything ever before known. + Let the Firestone Dealer equip your car now with these greatest of tires, choice of discriminating motorists everywhere.

Firestone
Supreme Balloon

LISTEN TO THE "VOICE OF FIRESTONE" EVERY MONDAY NIGHT BROADCAST THROUGH FIFTY STATIONS, N. B. C. NETWORK.

Copyright, 1930, The Firestone Tire & Rubber Co.

THE START OF THE BOATING SEASON

. . . when yachts head north and northern yachts go in commission

The 48' Dawn cruiser, equipped with twin Sterling Petrels, medium speed, 145 H.P., 1500 R.P.M., exceeding 30 M.P.H. Sterling equipped because of Dawn preference and public demand for this remarkable engine.

THE marine industry is expanding. Boat yards and engine plants are increasing facilities to meet the demand for yachts and engines. An addition to the Sterling plant is in process of erection, and we hope to make all deliveries without delay. You are respectfully urged to decide quickly, giving the boat and engine builders reasonable opportunity to provide for materials and a place in the erecting schedule.

STERLING ENGINE COMPANY BUFFALO, N.Y., U.S.A.

ENGINES OF 12 TO 565 H.P.

That Better Fruits and Vegetables may be grown Profitably

NICOTINE SULPHATE and other nicotine and tobacco derivatives are invaluable in both agriculture and animal husbandry.

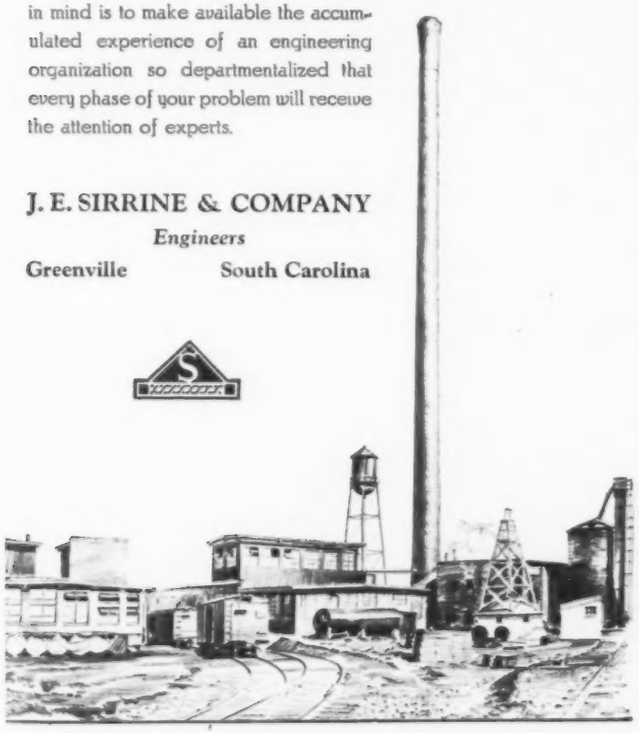
The building layout and special equipment of the Tobacco By-Products & Chemical Corporation at Louisville, Ky., afford an excellent illustration of a modern chemical process plant designed and built to meet specific process requirements.

This compact, modern and efficient plant was designed by us through the coordinated work of seven departments and then erected under our supervision.

It is but one illustration of the varied character of the industrial engineering problems we have handled in more than a quarter century.

To confer with us on a project you have in mind is to make available the accumulated experience of an engineering organization so departmentalized that every phase of your problem will receive the attention of experts.

J. E. SIRRINE & COMPANY
Engineers
Greenville **South Carolina**



Amphibians, powered by Isotta-Fraschini.
Courtesy of American Aeronautical Corporation

Continuing the Thrill

EVEN though you have become "air minded;" even though you may own a stableful of other fine cars, you simply can't get blasé about the spirited Isotta Fraschini straight-eight.

Clip all the superlative advertisements about motor cars you have read, place them end to end, and they will still not measure up to your reaction to an **actual ride** in this car—through traffic where you can sense the toe-touch brake response and far out along the open road where you can unleash all of its 140 mighty horsepower.

ISOTTA FRASCHINI

MADE IN MILAN, ITALY

ISOTTA MOTORS, INC.

NEW YORK: 119 West 57 · · · CHICAGO: 846 Rush

All that is beautiful shall abide forever

THERE can be no more fitting tribute to the worth and permanence of the service rendered by a great institution such as the Public Ledger of Philadelphia than to house its many departments in a building in which Vermont Marble has been effectively used. In all parts of the country, leading architects have specified Vermont Marble for banks, schools, libraries, municipal buildings, and great public service institutions . . . Vermont Marble can be used in *your* community to pay just tribute to the vision of those who guide the destinies of such financial, educational, and civic enterprises.

We shall be glad to send you illustrative material, showing how architects have used Vermont Marble in the design of great institutions as well as for buildings of more modest size.

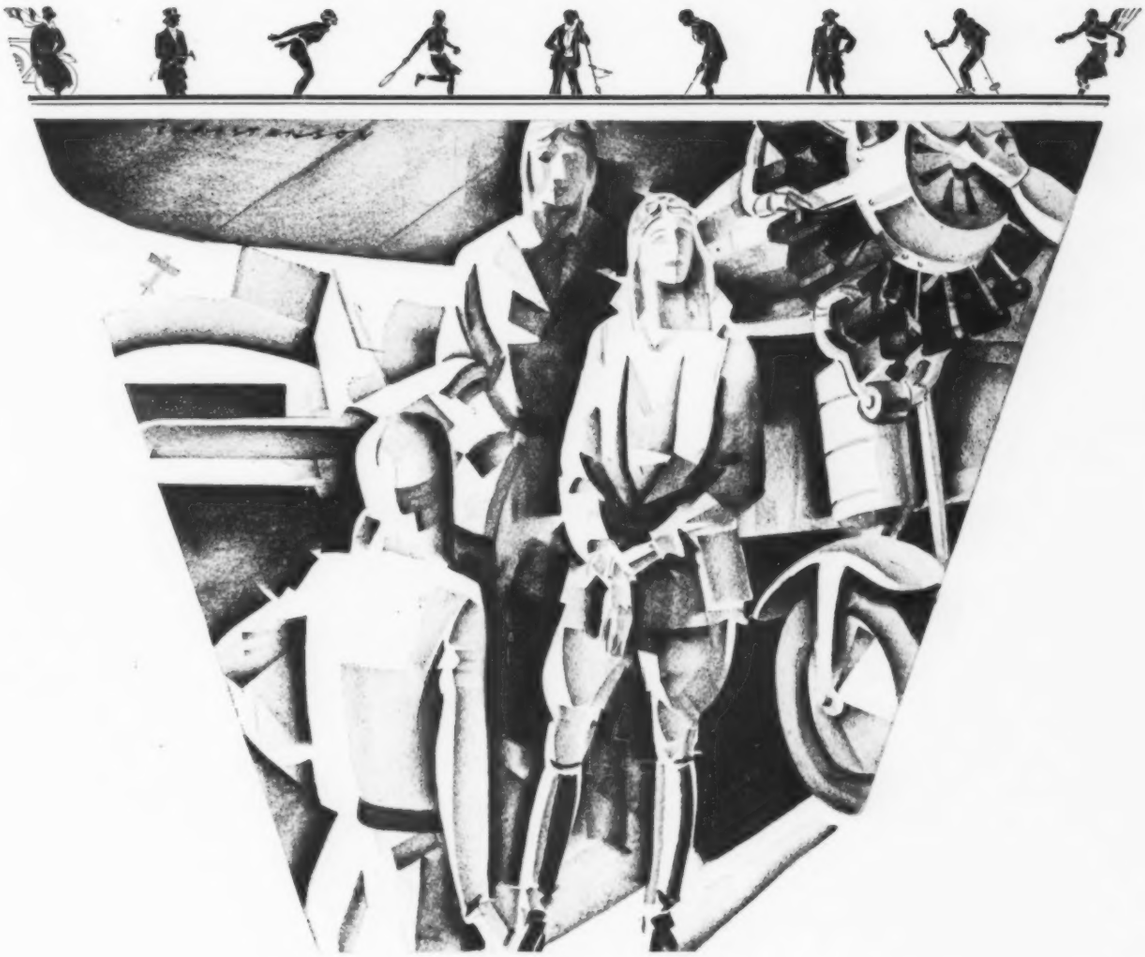
Public and family memorials to many of the great names in the history of America perpetuate, in the everlasting beauty and dignity of Vermont Marble, the memory which is so indelibly engraved in the hearts and minds of their countrymen. And in making their choice of materials that would endure for unmeasured time, the architects and engineers who built the famous Arlington Memorial Amphitheatre and Unknown Soldier's Tomb chose Vermont Marble, *the nation's memory stone.*

Write for our booklet, "All That is Beautiful Shall Abide Forever" . . . It gives helpful information on the problem of selecting appropriate memorial designs. Our Department of Plan and Design will gladly co-operate with a Master Craftsman in Marble in your vicinity, without obligation, in submitting sketches and estimates for your memorial requirements. Address: Dept. F 302, Vermont Marble Company *(the world's largest quarriers of marble)*, Proctor, Vermont.

In addition to the distinctive beauty of Vermont Marble is its resistance to the wearing effects of climatic conditions. Of these, the most destructive during the course of the centuries is moisture. Bulletins of the governmental Bureau of Standards show that monumental grades of Vermont Marble absorb only about one-third as much water as the average of other memorial stones . . . Vermont Marble is imperishable and everlasting.

VERMONT MARBLE

The Memory Stone



A

SPORTS-EYE VIEW OF FASHION

Have you ever worn a flying suit? Among the fascinating new ones shown by Marshall Field & Company is the cleverest little invention you ever saw . . . as feminine as curls, but much less bother. Nothing so adorable should be called efficient, but it's admirably fitted for its purpose. Thus it expresses perfectly the bright, modern spirit of every costume in the new Sports Apparel Room at Field's. Each is so exactly right, and flattering, and fashionable, that one can think only of the short French word for smartness to describe it.

▼ ▼ ▼

All the different, delightful clothes to fly, drive, ride, swim, play tennis, sail, golf, shoot, ski, or skate in are exceptionally well represented in the Sports Apparel Room. Here, too, is shown a complete selection of those charming necessities, "spectator" frocks and ensembles. You are invited to visit this tremendously enlarged section at Field's.

MARSHALL FIELD
AND COMPANY
RETAIL • CHICAGO

Off the Record

The suit business

THE highly profitable business of Mr. Clarence H. Venner is undoubtedly unique. And for that, every big corporation in the land is duly grateful.

It would be unkind to intimate that Mr. Venner has a "racket." Mr. Venner is in the suit business. He has been in it since 1886. He opens shop as soon as he discovers that a corporation is planning to reorganize, sell bonds, merge, or perform any other important corporate action, and he does not close shop until he has collected. His first step is to buy one hundred shares or so of the corporation's stock—unless, as often is the case, he already has some tucked away. Established as a minority stockholder, he then investigates, carefully, patiently, microscopically, the proposed plan and the reasons given therefor. He also casts a speculative eye on the company's charter and articles of incorporation. Nor does he neglect to peer into state corporation statutes. Time was when Mr. Venner did all this himself, but now, aging and prospering, he is believed to keep a large office force busy thumbing over statutes and charters. The object of all this thumbing is to turn up as large a crop of objections to the plan as possible. The objections may be technical or general, fundamental or superficial—as long as they offer some foothold for legal action.

His next step is to write to the directors of the company protesting strongly against the plan, perhaps hinting at recourse to the courts. This letter he generally follows up with a printed circular with scare headlines such as:

American Telephone & Telegraph Company
HIGH FINANCE
Stock Speculation and Juggling with Corporate Assets

or

Beware of Bonds
Illegally Guaranteed by
The New York Central Railroad Company

These circulars Mr. Venner proposes to scatter to the four winds of Wall Street. Before so doing, however, he thoughtfully sends printer's proofs to the company. This is the psychological moment. If the company lawyers see fit to settle the matter, Mr. Venner is willing to sell out his stock at a moderate price—moderate, that is, considering the damage that would be done the company at this critical moment if he should launch his public attack on it. If the company does *not* see fit, out go the circulars and in goes Mr. Venner to the courts. Sometimes he sues in his own name, sometimes under the name of one of the sixteen dummy corporations he has organized at one time or another—companies like the General Investment Company and the Continental Securities Company. He sues vigorously and persistently. More than thirty judges passed on the various motions and appeals in his attack on New York's Interborough Rapid Transit Company in 1908. Though he lost practically every appeal, he came back strong in 1910 and again, still fighting, in 1921. Persistent and energetic as Mr. Venner is, only about 5 per cent of his suits are successful. This does not worry him, however, for the suit itself and not victory is his object.

In the half century during which Mr. Venner has been running his suit business, he has taken on corporations as big as they come. The roster of his lawsuits (for partial list, see Appendix) starts with the Santa Fe railroad in 1886, runs through such sizable companies as United States Steel, Union Pacific, Pullman Company, New York Life, and New York Central to American Hide & Leather in 1925 and General Baking Company in 1928. These are the high lights of his legal battles. They won him from judges such sobriquets as "professional agitator" and "professional privateer." How many cases were settled out of court only Mr. Venner knows. Many of these companies, attacked by a lurid circular, have come out with a less lurid but equally vigorous rejoinder. So unusual a step indicates the calibre of Mr. Venner's attacks. They are often much more than popgun technicalities.

Like all soldiers of fortune, Mr. Venner has had his major campaigns, his rich prizes. The Bethlehem Steel Corporation will not soon forget the filibuster conducted by him at its stockholders meeting in 1917, when he objected to Mr. Schwab taking the chair in the absence of Mr. Grace (and won his point), demanded that the stock books be hunted up and brought into the room (and won), and insisted on messengers being despatched to New York for the stock ledgers (and won). Just what his purpose was remains a mystery. Perhaps it was mere pique: he had tried without success to prevent the meeting from being held. Perhaps he wanted to demonstrate his knowledge of corporation transactions—a knowledge that is probably without an equal in Wall Street. During that campaign he had seven suits going at once against the company. It is reported that a railroad, probably the Union Pacific, paid him $300,000 in 1900 for some short line bonds worth at par just $30,000, and in 1904 the Rock Island is said to have paid him $250,000 for some Nebraska Central stock which an I. C. C. expert appraised at exactly $000.00. Mr. Venner maintained, however, that the stock had real value, "especially to a large system like the Rock Island."

This defense is characteristic. Far from admitting that he is a professional obstructionist, Mr. Venner has his moments when he sees himself as a protector of property rights, as a Galahad breaking a spear for the great cause of business morality. In an attack on the legality of a New York Central bond guarantee, he delivered himself of these ringing words:

"Ten years ago, had any New Haven stockholder earnestly challenged the legality and integrity of some of the transactions which forced that Company into its unfortunate predicament and brought such poignant sorrow and distress to so many homes, he would have performed a great public service and earned the everlasting gratitude of those who were dependent for their support upon dividends from New Haven stock, although at the same time incurring the enmity of some financial leaders and their servile followers."

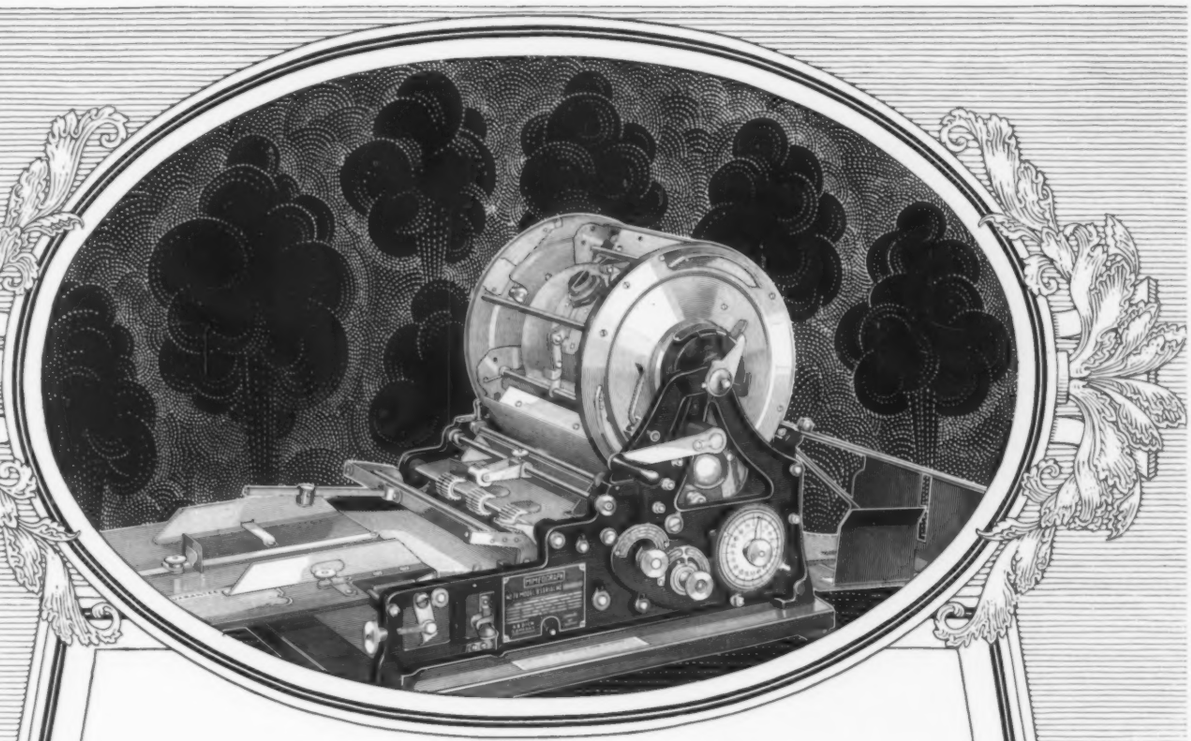
When August Belmont, in one of the I. R. T.'s hearings, tactlessly called Mr. Venner a blackmailer and an extortionist, the champion of morality was outraged. He issued a pink circular in which he stated that Mr. Belmont's "tactics . . . remind one of those animals who unwittingly disclose their whereabouts . . . by filling the atmosphere with a vile odor, directed towards their pursuers." He even began suit against Mr. Belmont for libel, but dropped it nine days after Mr. Belmont obtained a court order for his examination before trial.

Mr. Venner is without doubt a business success. An attorney who once sued him to collect his fee stated that between 1907 and 1913 he had prosecuted actions for Mr. Venner which brought in upward of one million dollars. And the tactless Mr. Belmont, in answering Mr. Venner's libel suit, claimed that James J. Hill paid Mr. Venner between one and two million dollars, at a time when Mr. Venner had already won two actions in a suit against the Great Northern. Even Mr. Belmont could not accuse Mr. Venner of one misdeed: "working" the same company twice. Once he has obtained a settlement from a company, he harasses them no more. This is a point of honor with Mr. Venner, and probably the greatest regret of his career is that he settled with United States Steel way back in 1902.

Mendelian curiosity

PLACE two gamecocks on opposite sides of a knot hole with food and water at their sides; they will starve to death watching each other. Pleased by this sinister parody on the legend of Pyramus and Thisbe, Thomas R. Kimball fifty years ago took to breeding gamecocks. He now has one hundred and fifty of them, each in a separate pen. Because the grounds surrounding his own residence are limited, Mr. Kimball's cock yards in Omaha, Nebraska, are situated behind his brother's house, which is a block away.

Every day Mr. Kimball visits his gamecocks, and almost every day he visits another establishment which is only a few blocks farther away. This is the magnificent Nebraska State Capitol, of which the celebrated late Bertram Goodhue of Manhattan was the designer. As all informed Nebraskans know, Thomas R. Kimball, a former president of the American Institute of Architects, was the professional adviser who selected the architects to compete for the design of the new State Capitol—and to him, therefore,



ALL STEAMED UP

Recent purchases of Mimeographs surely indicate that American business is pushing on at full speed ahead. New and better methods are being used. And in the forward-drive the Mimeograph is serving, with striking results, to cut costs and increase efficiency. Whatever the message, written, typewritten, or drawn, the Mimeograph speedily converts it into exact reproductions, at the rate of thousands every hour. Letters, bulletins, sketches, graphs, illustrated sales-data, tracings, questionnaires, etc., are had rapidly and economically in limitless quantities. The famous Mimeograph stencil sheets, the Mimeotype, and the new Cellotype, make mimeographing available today at less cost than ever before. For the aggressive promotion of business, and the cutting of operating expense, the Mimeograph is a great weapon just now. Write today for full particulars, without obligation, to A. B. Dick Company, Chicago, or to branch offices in principal cities.

MIMEOGRAPH

EDISON-DICK
MIMEOGRAPH
CHICAGO

Gentlemen's Clothes

FOR GOLF

AND COUNTRY WEAR

For the golfer who anticipates the season by selecting correct and comfortable clothes for wear on the links and in the country, we present a comprehensive group of garments in distinguished imported fabrics

Tailored for us by Hickey-Freeman in distinctive models embodying our newer style developments. Accessories for golf wear of quality and individuality

F. R. TRIPLER & CO.

Outfitters to Gentlemen · Established 1886

MADISON AVENUE AT 46 STREET

New York

belongs the credit of having such an architect as Goodhue rather than local talent.

Not long ago, the affairs of Thomas R. Kimball reached something of a tangle. The legislators, sitting in the Capitol, began to make a hubbub about Omaha's noise. Mr. Kimball's cock yards, flanked by a maternity hospital and a Christian Science Church, began to be pelted at dawn, when the cocks were crowing, by gin bottles—hurled, presumably, from a row of apartment houses across the street. Presently a tenant in one of the apartment houses complained in court of Mr. Kimball's cocks, describing them as a nuisance which should be immediately abated.

Mr. Kimball could quite easily have moved his gamecocks to pens on one of two farms he owns not far from the city, but this would have deprived him of the pleasure of feeding his birds. He decided that he would carry a defense against the tenant's action to the Supreme Court if necessary. Said he: "An irrepressible Mendelian curiosity early led me to experiment with the only bit of material that I could be automatically sure had not suffered by man's interference. God made the gamecock; a single drop of other blood banishes the game quality forever."

Naturally, Thomas Kimball was aware that in the interior of his State Capitol there are laws filed which forbid gamecocks to be employed in the only way possible. He pointed out that while the enforcement of the prohibition laws is open to debate, the forty-eight states have long deserted any but the most sporadic efforts to enforce the laws prohibiting cockfights, which are now held in pits all over the United States. He pointed out that the measure of the sport, expressed roughly in terms of dollars, could be placed at from $80,000,000 to $90,000,000 a year; that the best known cockfight magazine is supposed to have a paid circulation of from 70,000 to 100,000.

White Rock

Robert A. C. Smith, the genial chairman of the White Rock Mineral Springs Company, is on intimate terms with the reporters who throng around the New York City Hall and with Mayor Walker, who works within it. Social, wealthy, and interested in sports, he belongs to some fifteen clubs, including the New York Yacht, Union League, Seawanhaka-Corinthian Yacht, Turf and Field, Manhattan, and Lawyers'. He is fond of taking his friends to the theatre, provided the play contains a big White Rock scene. His alert assistants engineer White Rock scenes by finding out what plays contain or can be equipped with some highball guzzling. They then offer the producer free White Rock to mix with the stage whiskey (generally cold tea). If they are successful, Mr. Smith takes large and gay parties to the play, nudges his neighbor as the White Rock bottles appear. Sometimes the producer sticks to a siphon bottle as being more "realistic"—a piece of realism that costs him Mr. Smith's patronage. Even poultry cannot escape White Rock in the Smith family. His three sons used to have charge of the chickens in the summer. Noting that the chickens did not thrive, Mr. Smith discovered that they were living on a dry diet. He suggested drinks all around. This suggestion his sons obediently carried out—with White Rock.

Subway legend

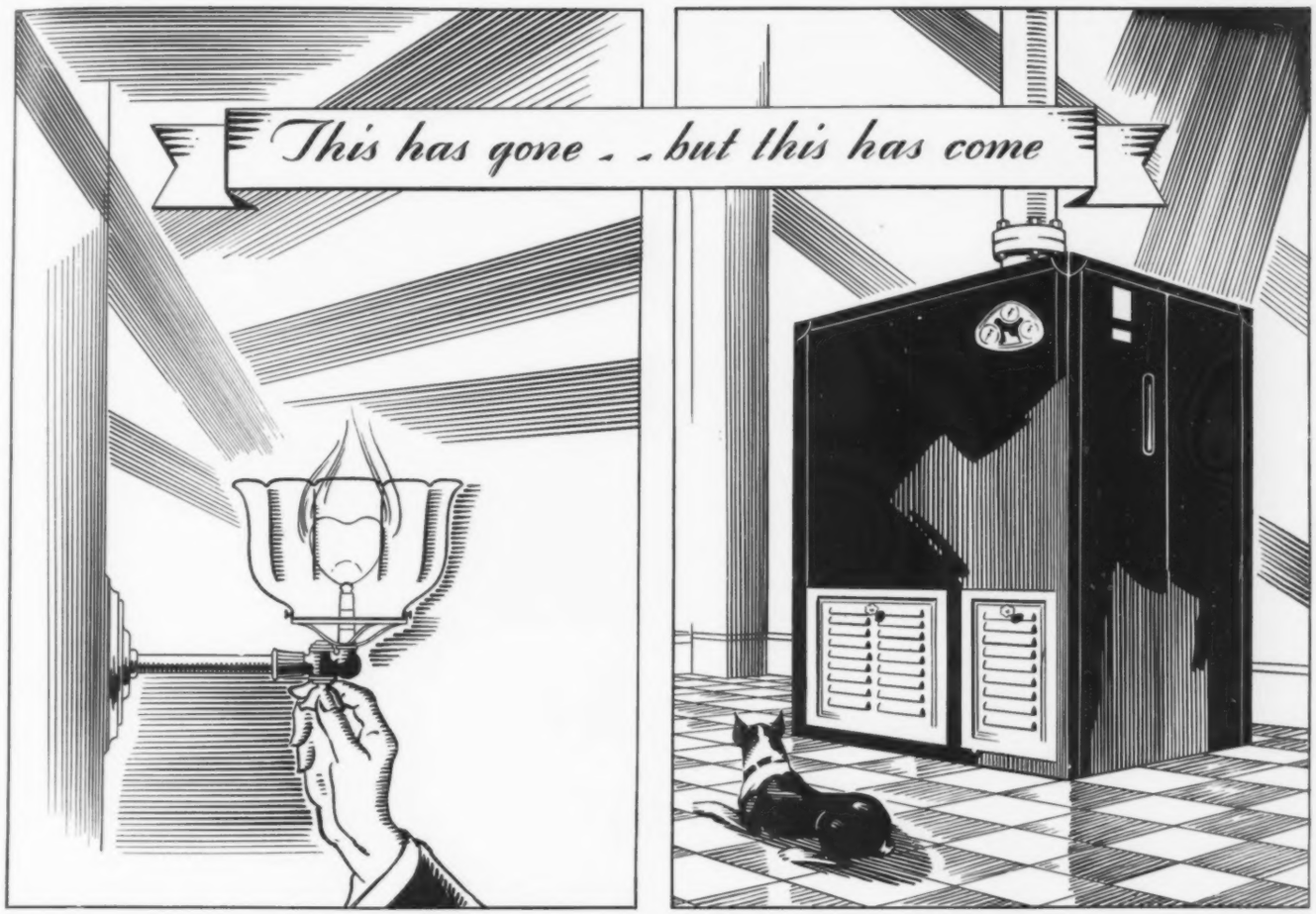
Not long ago, a broker of our acquaintance rode up in the subway with Arthur Curtiss James. During the entire trip, he insists, Mr. James calmly puffed on a cigar, without objections from either his fellow passengers or the guard.

Sheriff's successor

Most people know that A. Edward Newton, of Philadelphia, is a bibliophile who writes books as successfully as he collects them. Not so many know that he is president of the prosperous Cutter Electrical & Manufacturing Company. To a literary correspondent Mr. Newton explained the economic basis of his book-collecting:

Do you know what a safety valve is? It is something that goes off when there is too much steam in the boiler. Mark Twain refers to the captain of a Mississippi River steamer putting a small negro boy on the safety valve when he was racing the steamboat down the river. This might be called the adjustment or regulation of a safety valve. Very well. We manufacture, and have for forty years or more, an electrical equivalent of a safety valve. It is a contraption composed of magnets pulling against one

[*Continued on page 18*]



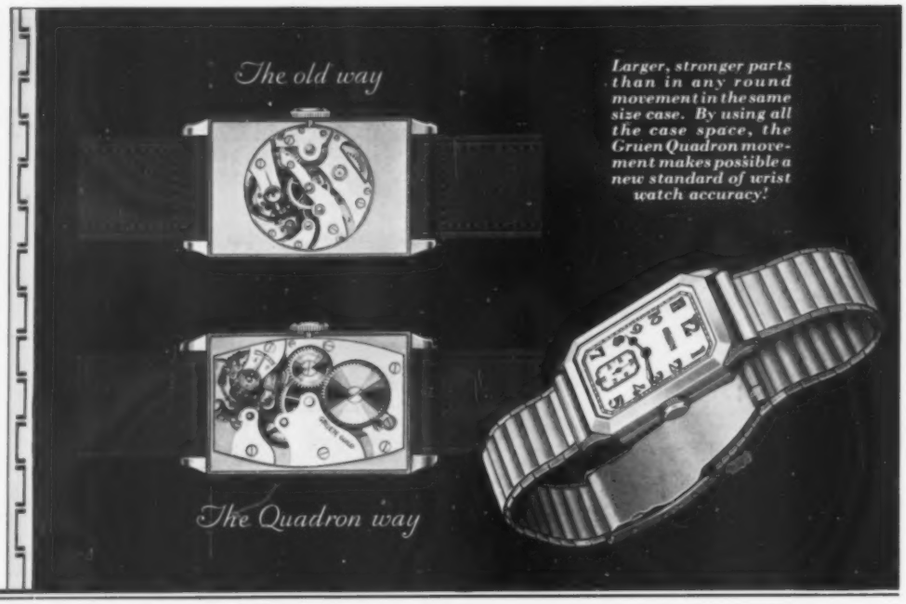
THE PUP AND THE GAS COMPANY

WHEN electric lighting came in, pessimists could see only a dark future for the gas company. Today, however, in addition to the huge industrial consumption of gas, more than one hundred thousand private homes each use approximately ten times the gas formerly required by both lighting and cooking. The explanation is gas heating.

In the days of gas light a ten-room residence used about thirty thousand cu. ft. a year for lighting purposes. Today, gas-heated, it uses from four hundred thousand to six hundred thousand cu. ft. in its heating plant alone, with gas for cooking, water heating and gas refrigeration extra.

The total gas delivered for house-heating in 1934 will be a material factor in gas company earnings. The suggestion contained in the familiar Bryant slogan—"Let your pup be Your Furnace Man" has been acted upon so widely in the past five years that the pup has proved himself an able ally of the gas company.

THE BRYANT HEATER AND MANUFACTURING COMPANY
17883 St. Clair Avenue • Cleveland, Ohio



Larger, stronger parts than in any round movement in the same size case. By using all the case space, the Gruen Quadron movement makes possible a new standard of wrist watch accuracy!

Top, the Techni-Quadron, for accurate time in seconds, $60. Second, Gruen Quadron, 17-jewel Precision *movement, $65. Third and bottom, two 17-jewel* Precision *Quadrons, 14-kt. solidgold, gold filled bands, $92.50 and $107.50 respectively.*

Every Gruen Watch is fitted with 15, 17, 19 or 21 ruby jewels—never less!

You Men who want *pocket watch accuracy* on your wrist

Advantages of the large size rectangular movement are obtainable in this Gruen Quadron for as low as $57.50 complete. Other Gruen Quadrons $50 to $250.

HERE is the Quadron that set a record for wrist watch accuracy which, so far as we know, has never been equalled!

Two hundred Gruen Precision Quadrons—exact duplicates of those your Gruen Jeweler will now show you—were subjected to official observatory tests in Switzerland. And every Quadron so tested won the Observatory certificate of time-keeping excellence!

The idea which made this record possible—how simple it really is, as shown above!

Most rectangular wrist watches contain round movements. The Gruen Quadron principle, makes the movement rectangular, using the entire case for larger, stronger parts. The result is the nearest approach to pocket watch accuracy ever put on the wrist!

You men who want pocket watch accuracy on your wrist—examine the Quadron at your Gruen Jeweler today.

He can show the Quadrons pictured here, together with many others in a variety of cases, priced from $250 to $50. From professional experience he finds the Gruen Watch today the greatest value for every dollar you invest.

There is a Gruen Guild Watch to suit the taste of every member of the family. Prices $3500 to $27.50.

Gruen Watch Makers Guild, Time Hill, Cincinnati, U.S.A. Branches in various parts of the world. Engaged in the art of making fine watches for more than half a century.

PRECISION
Trade Mark Reg.

This GRUEN pledge mark is placed only upon watches of higher accuracy, finer quality and finish—none less than $65. Made only in the Precision Workshop.

Look for the mark Precision *on the dial.*

In the new Classified Telephone Directory you will find under "Gruen Guild Watches" the name of your nearest Gruen jeweler. His store is marked by this Gruen Service emblem.

GRUEN WATCHES

The Gruen Quadron

Eleven years elapsed between the painting of the two Pierce-Arrow portraits on this page.. both by the same artist, both the same scene, both portraying America's Finest Motor Car.

The Tyranny *of* Tradition

ONLY the stern mandate of very great pride .. and no lesser legislation on earth .. may command always the finest a man or an organization has to give. Such is the tradition which governs the creation of *America's finest motor car*.

No rules ever conceived could be more exacting than the set of ideals which freely operate in every phase of Pierce-Arrow manufacture.

There is in Pierce-Arrow precincts an always-burning fire of determination never to depart from a principle which puts *fineness eternally first*.

In every car of this patrician line is expressed a courage which scorns the accepted standards of excellence as commonplace, compared with Pierce-Arrow's own.

And there is ever present a pardonable disdain of any process less fine than the hand-craftsmanship which has always distinguished Pierce-Arrow motor cars.

It would be far easier to build Pierce-Arrows of average quality, and infinitely more profitable to produce them in greater numbers. But the tyranny of tradition forbids.

THE NEW PRICES

$2695 to $6250.. *at Buffalo*

(Custom-built Models up to $10,000)

In the purchase of a car from income, the average allowance on a good used car usually more than covers the initial Pierce-Arrow payment.

THE PIERCE-ARROW MOTOR CAR COMPANY • BUFFALO, N. Y.

PIERCE-ARROW

Banff

... SOCIAL CAPITAL OF THE CANADIAN ROCKIES

18-HOLE
GOLF COURSE

TWO
SWIMMING POOLS

"EN TOUT CAS"
TENNIS COURTS

RIDING

INDIAN DAYS
JULY 20-22

OFFICIAL
TRAIL RIDES
JULY-AUGUST

HIGHLAND
GATHERING
AUG. 29-SEPT. 1

THE MOUNTAIN CHAMPS ÉLYSÉES OF NORTH AMERICA

The huge baronial hotel sits at the head of a twenty-mile mountain valley, blocked off at the end by the stern granite cliffs of the Fairholme Range. You look out from the tea-lounge upon 10,000-foot peaks . . . upon the foaming, jade-green falls, upon the changing cloud-shadows and the still vastness of the true Rockies. Below you are the terraces. Groups of people sit silent there, gazing on the view. Below, lively parties splash about the swimming pools, play at clock golf or lounge on the sunning terrace. Below again, riders canter through the spruces of the bridle-paths, golfers play the famous 18-hole course, or dawdle over a cool drink on the clubhouse veranda. Famous motor-drives start from Banff . . . climbing with Swiss guides . . . trail-rides. Within, the hotel is keyed to the tastes of fastidious people . . . 10-piece dance orchestra . . . nightly concerts, galas, entertainments . . . metropolitan cuisine and service . . . all as smart as if it were on the Champs Élysées.

Only 40 miles away lies Lake Louise, jewel of the mountains, a famous playground, served by Chateau Lake Louise, a hotel with the same excellence as Banff.

CANADIAN PACIFIC
BANFF SPRINGS HOTEL

Come up this summer and stay! Special monthly rates for families, European plan. Single with bath, $8 up per day; double, $14 up. Period suites for two, $35 up. Special servant quarters. All rates are 20% lower during May, June, September. Come up . . . something doing all summer long!

Opening May 14th. For reservations, rates, information, write *Banff Springs Hotel, Alberta, Canada,* or any Canadian Pacific Office: New York, Chicago, Atlanta, Boston, Buffalo, Cincinnati, Cleveland, Dallas, Detroit, Indianapolis, Kansas City, Los Angeles, Memphis, Minneapolis, Omaha, Philadelphia, Pittsburgh, Portland, San Francisco, St. Louis, Seattle, Tacoma, Washington. In Canada: Montreal, Nelson, North Bay, Ottawa, Québec, Saint John, Toronto, Vancouver, Victoria, Winnipeg.

BANFF SPRINGS.....A CANADIAN PACIFIC HOTEL

THE COMMAND AND CREW

Personality! That human quality that enriches all contact between man and man . . . nowhere is it more vividly exemplified than in the command and crew of the United States Lines. Selected for command because of a seven-seas reputation for courage, leadership and resourcefulness. Chosen for service on deck, in salon or in cabin because of an inborn graciousness, civility and tolerance. You'll sense the difference . . . be conscious of an unobtrusive spirit of highly talented service when you travel to Europe on a United States Liner, be it the Leviathan, world's largest, or one of these magnificent cabin ships — George Washington, America, Republic, President Roosevelt and President Harding. Superfine service and staunch safety ride with you to and from Europe . . . under the Stars and Stripes!

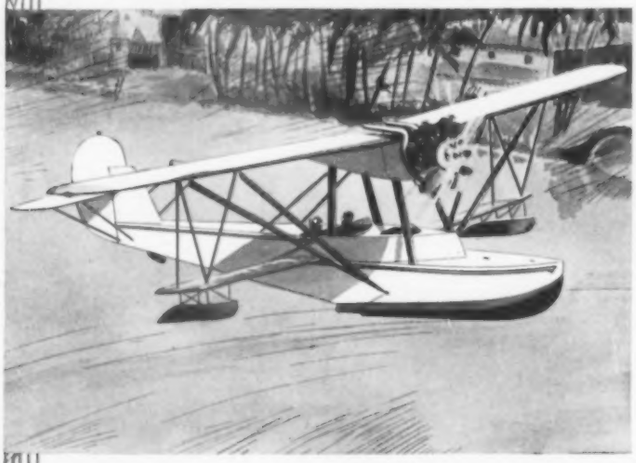
UNITED STATES LINES

For complete information see your local agent or our offices: New York, 45 Broadway; Atlanta, 714 Healy Building; Boston, 75 State Street; Chicago, 61-63 West Jackson Boulevard; Cleveland, Hotel Cleveland Building; Detroit, 1514 Washington Boulevard; St. Louis, Jefferson Hotel; Philadelphia, 1600 Walnut Street; San Francisco, 691 Market Street; Los Angeles, 756 South Broadway; Minneapolis, 312 Second Avenue, South; Seattle, 1337 Fourth Avenue; Pittsburgh, 705 Liberty Avenue; Washington, 1027 Connecticut Avenue; Little Rock, Wallace Building; New Orleans, Hibernia Bank Building. Paris, 10 Rue Auber; London, 14 Regent Street, S. W. 1.; Hamburg, Cor. Alsterthor & Ferdinandstrasse; Berlin, Unter den Linden 9. THESE LINES OFFER A COMPLETE FREIGHT SERVICE — SPECIFY AMERICAN SHIPS FOR YOUR FOREIGN TRADE

the sport of speedboating ... and the thrill of flying!

The Eastman Flying Yacht—fast as a speedboat on the water, maneuverable as a light plane in the air—makes possible the combined enjoyment of two great, thrilling sports. "Yachting" in the Eastman is the newest recreation of sportsmen—a pleasurable diversion that is without comparison. ¶ Trim and clean and graceful of line, the Eastman responds so readily to the controls that flying it is really play—handling the wheel is simple. Taking off is unbelievably easy—and landing simplicity itself as only one point of contact is necessary. ¶ In the spacious cockpits of the Eastman, three or four—according to fuel loading—can be comfortably accommodated. Even when fully loaded the Eastman Yacht leaves the water in 8 to 12 seconds; climbs 900 to 1000 feet per minute; cruises at 85 m. p. h.—110 open throttle; and has a radius of over 300 miles. ¶ The "Yacht" is popularly priced at $9595. Write for complete information about this smart, trig craft. Dealers interested in adding the Eastman Flying Yacht to speedboat lines are invited to write for full particulars.

THE EASTMAN FLYING YACHT



DETROIT AIRCRAFT

UNION TRUST BUILDING, DETROIT

CHANIN BLDG., NEW YORK :: ROOSEVELT BLDG., LOS ANGELES

EASTMAN AIRCRAFT CORPORATION
RYAN AIRCRAFT CORPORATION
LOCKHEED AIRCRAFT CORPORATION
AIRCRAFT PARTS COMPANY, INC.
PARKS AIR COLLEGE, INCORPORATED
PARKS AIRCRAFT CORPORATION
BLACKBURN AIRCRAFT CORPORATION
AIRCRAFT DEVELOPMENT CORP.
MARINE AIRCRAFT CORPORATION
GROSSE ILE AIRPORT, INCORPORATED
GLIDERS, INCORPORATED
DETROIT AIRCRAFT EXPORT CORP

another—all subject to adjustment, adjustment predetermined or dependent upon local conditions or upon conditions at a distant point. It is known to the trade as an I-T-E circuit breaker. The smallest I-T-E circuit breaker is about the size of a cigar box and costs, perhaps, ten dollars. The largest I-T-E circuit breaker is about the size of six steamer trunks placed one upon the other and weighs several tons.

We do not have a monopoly of the manufacture of this device by any means, but when people want the best they almost invariably buy it from us. This, it is, that enables me to go out and pay $20,000 for a volume of Dickens and $60,000 for a volume of Shakespeare.

With the same acumen which has made him one of the most redoubtable book-collectors on either side of the Atlantic (his *coups* have included Hardy's manuscript of *Far from the Madding Crowd* for $3,500, now worth over $75,000; Stave I of the *Christmas Carol* for thirty shillings; and the only unexpurgated, uncut copy of Boswell's *Johnson* in the original binding), Mr. Newton built up his business from a bankrupt concern. Of his early days he wrote his correspondent: "When I first took over the finances of the Cutter Company, the sheriff was acting as general business manager, and I cannot imagine a worse one."

Captain Buckham

On pages 75 to 79 of this issue FORTUNE prints (for the first time in America) a portfolio of the extraordinary photographs taken by Captain Alfred G. Buckham. As immobilized fragments of the panorama which is spread out before the eyes of the aviator, these photographs are without equal, artistic or technical. They suggest that the photographer and the artist who work, earth-bound, on the world's surface, have barely begun to record its line, its color, and its variety. Captain Buckham is an Englishman. His flying is done in the face of a disability which usually makes men invalids. A metal throat is not a comfortable anatomical oddity, nor is breathing through a tube entirely satisfactory. Captain Buckham has written, for FORTUNE, this brief sketch of a life which is as unusual as his works.

Commenced in London. But the doctors immediately discovered it was a mistake and that the event should have occurred in the country. Prompt exodus of the family took place to the Isle of Wight. My appearance exceedingly deceitful until I was well advanced in the teens. The nurse said I always looked as strong as a Norse, but had a bad propensity for getting one leg in the grave every winter.

I decided to become a painter, my early attempts causing an eminent artist to persuade me that I had found my proper vocation. I worked steadily for some years until I went to study Turner's pictures in the National Gallery. I looked at them for a whole day, went to sleep on it, and in the morning gathered together the fruits of my labor, and made with them the finest bonfire I have ever seen. I believe I was one of the first to take photographs in open landscape with no other lighting than that of the moon and stars—a very fascinating branch of work.

Then the War came. Eventually, I sallied forth and joined the photographic section of the Royal Naval Air Service. After three weeks' "discipline" I commenced to instruct on an aërodrome, shouting and bawling the whole day through in competition with the uproar of aëro engines, and in six months my voice was gone. Then, into hospital, to emerge very little better. After three months' lecturing and testing of photographic plates and chemicals, I was appointed in charge of aërial photography in the Grand Fleet. Demobilization came three months after Armistice, but my voice was entirely gone, and throat so much inflamed and swollen that breathing was difficult. As I could not breathe in the atmosphere of a darkroom, I fell back on my paint box and did water color drawings of aërial subjects. I never arrived at the stage of making a second bonfire, for I was only given three or four months in which to collect material, and then my painting came to a sudden ending, for my breath stopped short one day in a crowded street and I crumpled up. Then one of the best surgeons in all the world turned up, and decided that me and my larynx must part company for good, for it was the most abominable larynx he had ever seen.

That was ten years ago, and for nine of them I have been flying and taking aërial photographs, with discretion, for I suppose that when a man is classed 100 per cent disabled he mustn't expect to compete with Colonel Lindbergh.

"Quietized" office of C. A. Upson, President of the Upson Company, Lockport, New York, manufacturers of the famous Upson Wallboard.

NOISE levies a staggering toll on American business. Records prove that no single factor—save poor ventilation—causes more absences, more resignations, more forced retirements than does Noise, whether it comes from within the office or without. Noise cuts down efficiency—the quality and quantity of the work turned out—both your own and that of your staff. Worst of all, it affects most severely your highest-paid workers—your executives and heads of departments.

Why suffer its distractions longer? Why not "quietize" your office, and those of your important staff, with carpets? You'll find, as hundreds of business men have found, that carpets will pay for themselves many times over, in a greatly increased production.

There are deep-piled Mohawk fabrics to deaden direct Noise and to absorb the incessant barrage of indirect sound. Your nearest Mohawk dealer is prepared to counsel you on weaves, colors, patterns, pile-depths and costs—and to measure and lay your carpets. Why not consult him?

MOHAWK RUGS & CARPETS

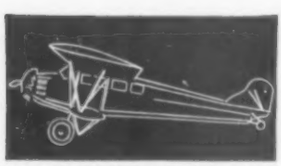
© 1930 MOHAWK CARPET MILLS, AMSTERDAM, NEW YORK

FORTUNE LIES ABOVE THE CLOUDS

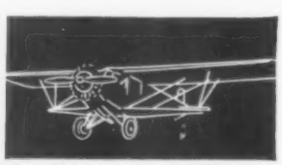
The Buhl Senior Airsedan is an eight-place, dual-control plane, priced at $18,500 with the Wasp engine and $19,500 with the Hornet or Cyclone.

GOLD at the end of the rainbow was once a dream. Today it is a fact. Time is money just as surely as though it were minted in the Treasury. Executives take to the air — the rainbow trail — pursuing it. Corporations establish air transport as a definite part of progressive programs. Aviation has become inevitably allied with big business. Planes swoop and circle on their stated paths ... profits mount when the unproductive hours devoted to travel are reduced to a minimum. And planes today are produced and sold on the same strictly business basis upon which they are used. The Buhl Aircraft Company has behind it almost a hundred years of leadership in many varied enterprises. Surely that is sufficient guarantee that its policies and its product are worthy of consideration by men to whom air travel has become a byword for commercial and industrial progress.

We will gladly mail to any executive an interestingly illustrated brochure entitled "Above the Clouds."



The Buhl Standard Airsedan is a six-place, dual-control plane, priced at $13,500 with the J-6 Wright Whirlwind engine.



The Buhl Sport Airsedan is a three-place, dual-control plane, priced at $12,000 with the J-6 Wright Whirlwind engine and $11,000 with the J-5.

BUHL AIRCRAFT COMPANY
MARYSVILLE, MICH.

Buhl Air Sedans
SENIOR · STANDARD · SPORT

Statistics

Matter of record

The strata of the American financial atmosphere have been plumbed for 1928. Density is a bit greater, but the ceiling no more remote. At sea level there are two million wage earners getting thirty cents an hour or less; that is to say there are ten million people living on family incomes of eighteen dollars a week or less. Overhead there is the wide belt of incomes from one thousand to three thousand dollars. Rarification sets in at the next level.

As a matter of record, the 1928 barometric readings from the three-thousand-dollar level up, with 1927 readings, are printed below:

Stratum	*1928*	*1927*
$3,000— $5,000	3,114,489	1,209,345
5,000— 10,000	561,114	567,700
10,000— 25,000	265,438	252,079
25,000— 50,000	67,300	60,123
50,000— 100,000	26,838	22,573
100,000— 150,000	6,988	5,261
150,000— 300,000	5,605	3,873
300,000— 500,000	1,720	1,141
500,000—1,000,000	971	557
1,000,000 and over	496	290

Barometric computations for the extreme reach, over five million dollars, are speculative. Most reliable readings indicate that in 1928 there were twenty-four (as compared with eleven in 1927) individuals with incomes over five million dollars.

It appears that stock market maneuvers are safer at altitudes from $25,000 up. At the level under $5,000, something short of $300,000,000 was gained from speculation by 3,000,000 people (say about $100 a head). The half million in the 5 to 10 class made $360,000,000 (say about $720 a head). The quarter million in the 10 to 25 class made $700,000,000 (say about $2,800 a head). The 67,000 in the 25 to 50 stratum made $540,000,000 (say about $8,000 a head). The 26,000 in the 50 to 100 level made $348,000,000 (say about $13,000 a head). These are 1928 figures.

What happened to the denser strata when the market broke is shown by the 1929 withdrawals from savings banks in New York State, which exceeded by $204,000,000 the amounts deposited.

Coal to coal

Reverse the processes of manufacture, and almost everything will turn, in part, to coal. A ton of steel will become a pile of iron ore and two tons of coal. This printed page will become a bit of pulp, a stain of chemicals, and twice its weight in coal. A ton of cement will revert to its own constituents and half a ton of coal. A roof of copper shingles crumbles into metal and three times its weight in coal. Or reverse the processes that keep a house running. If the heat coagulates again into fifteen tons of coal, the gas will solidify to eleven, the ice to four-fifths of a ton, the electricity to one and one-fifth tons. Of course some domestic processes, reversed, become water power or oil. But nine-tenths of the billion horsepower in America is produced by fuels, and, of these, three-fourths by coal. The supply of coal is such that it would last four thousand years at four hundred million tons a year. England's coal at that rate would last four hundred and fifty years, Germany's a thousand.

• • •

The United States has the world's largest chemical industry. It has grown 500 per cent in the last twenty-five years. The Allied Chemical & Dye Corporation is the largest chemical company in the world. Add to Allied Chemical, du Pont and Union Carbide & Carbon, and the combination is about twice as big as the I.G. Farbenindustrie or the English Imperial Chemical Industries.

• • •

Of the 20,000 theatres in the United States, only about 6,250 are equipped to show sound pictures.

• • •

It would take 2,000 freight engines to break one cable on the Hudson River suspension bridge. A yard in diameter, each cable contains 26,474 separate wires.

GREAT IN THE SHOWROOM
. . . GREATER IN THE AIR

NICKELED fittings, artistic color combinations and polish add brightness and attraction to the showroom dress of any airplane. » Yet airplanes that are great in the showroom must prove themselves greater in the air . . . to those who buy for durability, economical operation and faithful performance. » Spartans are great in the showroom . . . but greater in the air. Brilliant performance, positive control at all speeds, stability . . . these are not idle claims, but qualities that pilots admire in every Spartan. Price for price, performance for performance, quality for quality . . . Spartan offers the year's greatest value in fine airplanes. » Write for illustrated literature describing each Spartan model . . . see them at the All-American Aircraft Show, Detroit, April 5th to 13th.

SPARTAN AIRCRAFT COMPANY
TULSA, OKLAHOMA

Spartan biplanes are offered with the choice of three engines: The 225 h. p. Wright "Whirlwind Seven," the 165 h. p. Comet, and the 165 h. p. Wright "Whirlwind Five." Prices, fully equipped, range from $7750 to . . . . . $5675 fly away Tulsa

1880 GOLDEN ANNIVERSARY YEAR 1930

DAVEY TREE SURGERY

Reproduction from a painting made on the campus of the Sweet Briar College, Sweet Briar, Virginia, by Frank Swift Chase

© The D. T. E. Co., Inc., 1930

Half a century since John Davey originated the science of Tree Surgery

FIFTY YEARS ago John Davey began experimenting with his new theory that trees could be saved by curative processes. Were they not living things? Were they not subject to disease, injury and other ills? And yet to most men they were just trees, destined to die whenever circumstances took them.

Countless millions of people had seen trees die—if they saw trees at all—without ever a thought that they could be saved. John Davey saw sick and injured trees with understanding and sympathy. He conceived the idea that a system of methods and treatment could be devised that would save innumerable trees that were being lost unnecessarily.

What gave him the idea no one knows. John Davey passed away suddenly nearly seven years ago without disclosing the source of his inspiration. He did a comparatively rare thing; he gave the world a new idea.

JOHN DAVEY
1846-1923
Father of Tree Surgery
Reg. U. S. Pat. Office

As with most new ideas, John Davey endured the long and bitter struggle against ridicule and cynicism and inertia and established habits of thinking. He struggled forward with remarkable determination and with sublime courage. He lived long enough to see his new science a proven success both from a practical and a commercial standpoint.

Like most geniuses John Davey did not care much for money. He had a profound love of nature and was not only thoroughly trained in horticulture, but was an eager student of the related sciences. He not only gave to the world a new idea, but he gave a fine philosophy also. To him the whole development became a great ideal of usefulness and constructive service. His spirit impressed itself indelibly and is a living force in the organization that he founded and inspired.

Send for nearest Davey representative to examine your priceless trees without obligation. Any necessary work will be done at reasonable cost. Davey service is local to you. Write or wire Kent, Ohio.

THE DAVEY TREE EXPERT CO., Inc.
401 City Bank Bldg., Kent, Ohio

Branch offices in all important cities between Boston and Kansas City, between Canada and the Gulf.

MARTIN L. DAVEY, *President and General Manager*

Tune In Davey Tree Golden Anniversary Radio Hour

Every Sunday afternoon, 5 to 6 Eastern time; 4 to 5 Central time; over the Red Network National Broadcasting Company. Featuring the old-time songs that everyone knows and loves. Listen to Chandler Goldthwaite on the Skinner Residence Organ.

That place called "HOME"

A HUNDRED YEARS AGO, John Howard Payne wrote "Home, Sweet Home." His song is immortal . . . who does not long to call his own some piece of the earth and a shelter built upon it?

There never has been a better time to realize your dream. Many sound finance plans make it easy for everyone to buy or build. Money rates are low.

There never has been a better time to assure that your new home will be comfortable and healthy. Heating has reached a new high standard in Capitol Boilers—the Red Top, the Red Cap, and for small homes, the Red Head.

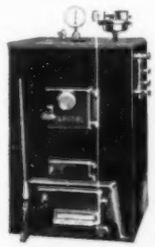
Far more than a promise of adequate and thrifty warmth lies beneath the glistening red and blue of their handsome, rock-wool insulated jackets. These fine heat makers are sold with an iron-bound guarantee of results, whether coal, coke, oil, or gas is used for fuel.

In buying or renting, Capitol Guaranteed Heating is your assurance of a home built to serve and satisfy. When building, your architect and responsible heating contractors can prove that there is no wiser choice. Write now for the illustrated free booklet on house heating, *A Modern House Warming.*

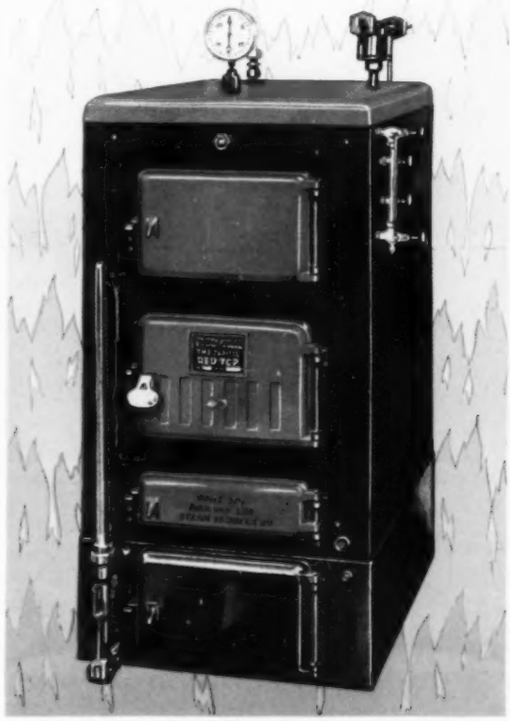
The kitchen in the home of John Howard Payne

UNITED STATES RADIATOR CORPORATION
DETROIT, MICHIGAN
8 Factories and 35 Assembling Plants Serve the Country
For 40 years builders of dependable heating equipment

THE PACIFIC STEEL BOILER CORPORATION
Division of the United States Radiator Corporation, builds welded steel heating boilers for buildings of all sizes from bungalows to skyscrapers.



The Capitol Red Head
To small homes this handsome heat-maker, with rock wool insulation, brings the advantages of radiator heat for little if any more than the cost of your second choice in heating equipment.



The Capitol Red Top
This is, we believe, the finest square boiler yet achieved. Rock wool insulation. Staunch jacket in baked enamel. Vitreous enamel doors.

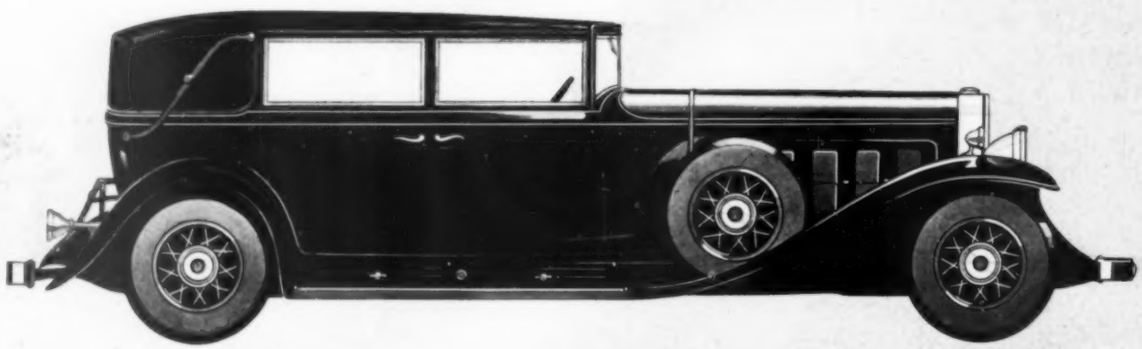
© 1930, U. S. R. Corp.

The Capitol Red Cap
Embodies every improvement known in round boilers. A thick blanket of rock wool, the finest insulation obtainable, suggests its quality in every particular. For medium sized residences.

Guaranteed Heating WITH

Capitol Boilers

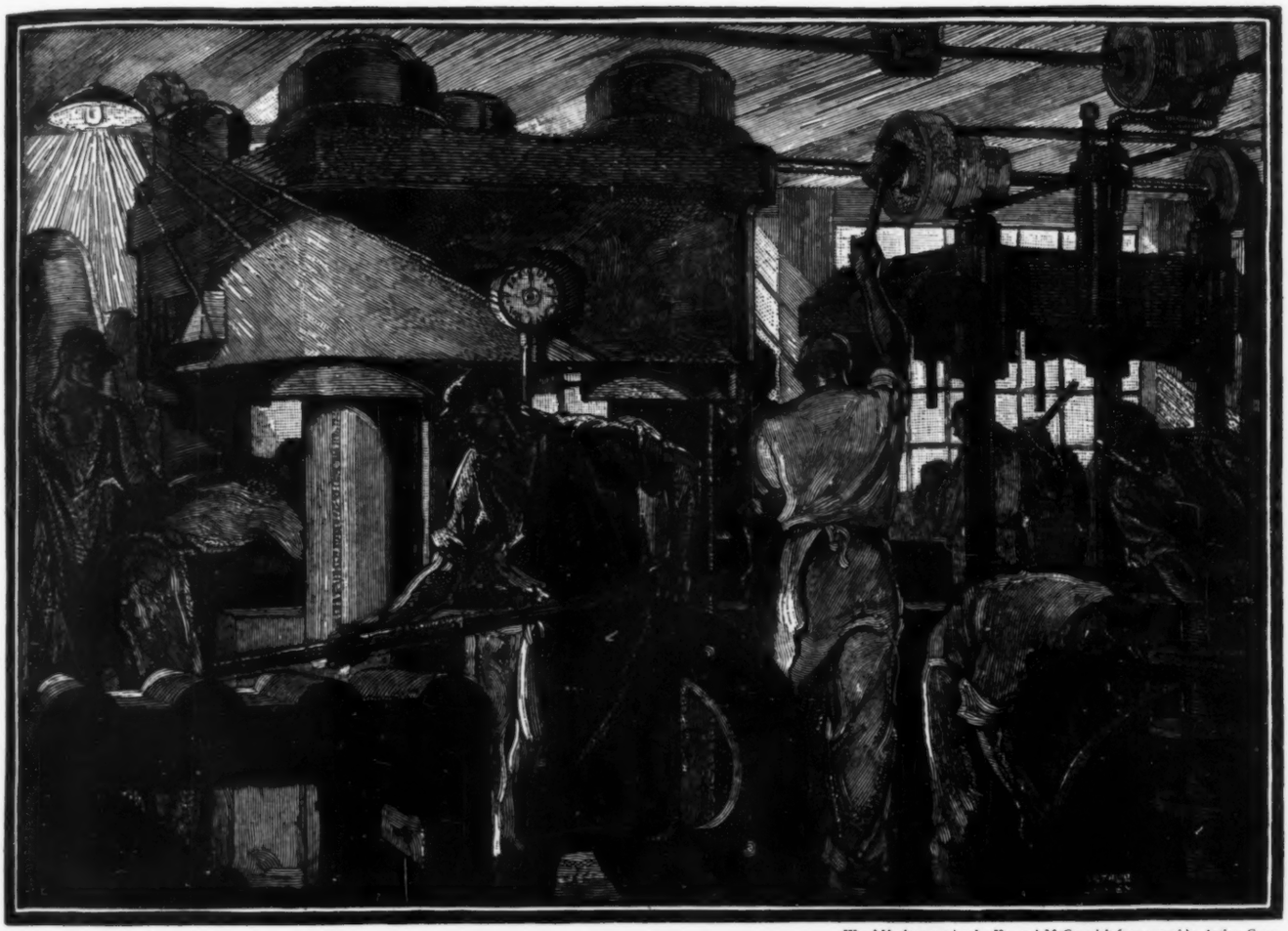
AND RADIATORS



SIXTEEN CYLINDERS

Custom-built . . . the most highly
personalized of all motor cars

CADILLAC MOTOR CAR COMPANY . . . DIVISION OF GENERAL MOTORS



Wood block engraving by Howard McCormick from mural by Arthur Covey.

Grains of tough, sharp abrasive — plastic organic bonding material — application of heat — tremendous pressure. And one type of grinding wheel is formed.

In direct contrast, wheels their equal in cutting efficiency, but for different kinds of work, take their form from pouring a semi-liquid mass into molds.

Three abrasives, five bonding processes, hundreds of formulae are employed by Norton Company, Worcester, Massachusetts in making grinding wheels to meet the world's widely varying requirements.

NORTON

Grinding Wheels

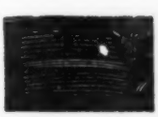
Grinding and Lapping Machines

Refractories

Porous Plates

Floor and Stair Tile

Pulpstones



The New York Trust Company

Capital, Surplus and Undivided Profits $45,000,000

TRUSTEES

H. M. Addinsell	Harris, Forbes & Company
Frederic W. Allen	Lee, Higginson & Company
Mortimer N. Buckner	Chairman of the Board
James C. Colgate	James B. Colgate & Company
Alfred A. Cook	Cook, Nathan & Lehman
Arthur J. Cumnock	Catlin & Company, Inc.
William F. Cutler	American Brake Shoe & Fdy. Co.
Harry P. Davison	J. P. Morgan & Company
Robert W. De Forest	De Forest Brothers
George Doubleday	Ingersoll-Rand Company
Russell H. Dunham	Hercules Powder Company
Samuel H. Fisher	New York
John A. Garver	Shearman & Sterling
Artemus L. Gates	President
Harvey D. Gibson	Chairman Executive Committee
Charles Hayden	Hayden, Stone & Company
F. N. Hoffstot	Pressed Steel Car Company
Walter Jennings	New York
Darwin P. Kingsley	New York Life Insurance Co.
Edward E. Loomis	Lehigh Valley Railroad Co.
Robert A. Lovett	Brown Brothers & Company
Howard W. Maxwell	Atlas Portland Cement Company
Edward S. Moore	New York
Grayson M.-P. Murphy	G. M.-P. Murphy & Company
Harry T. Peters	New York
Dean Sage	Zabriskie, Sage, Gray & Todd
Louis Stewart, Sr.	New York
Vanderbilt Webb	Murray, Aldrich & Webb

---

100 BROADWAY

40TH STREET AND MADISON AVENUE **57TH STREET AND FIFTH AVENUE**

How Impatience

WHICH DISRUPTED MERCHANDISING, SELLING AND MANAGEMENT

Undermined Earnings

A GREAT doctor has said: "Over 60% of the important cases are diagnosed incorrectly. Not until post-mortems are compulsory will the medical profession approach a scientific status."

In business, the lack of analyses of the causes of failure and success is correspondingly serious.

Here is the story of a re-organization that proved almost fatal, due to erratic merchandising, unbalanced selling, and confused management—all in all, a general demoralization, primarily the result of impatience.

The Company made packaged specialties for a universal need. It was an old Company, ultra-conservative in its methods, for years the leader in its field, and enjoying the highest reputation with the trade and the public. Its distribution was through department stores and other high class outlets, 70% direct.

The line consisted largely of shopping merchandise, 90% of which was sold through *selection* by the consumer rather than by specific demand.

Recently the business had become increasingly subject to style trends; the sales curve had turned downward, and the management had suddenly determined that heroic measures were necessary.

Counsel was called in. Two drastic changes were proposed:

First: That a specialized Merchandising Staff be developed, composed of persons competent to discover the preferences of the trade and the public, and to reduce sales resistance by creating new lines to meet such preferences;

Second, and complementary: That a new Sales and Advertising Policy be adopted in order to make effective *through the trade to the consumer,* the results of this merchandising work.

The reasons for the changes were lucidly set forth; their drastic nature was pointed out, the dangers of precipitate action were presented with all force, and a five-year period was recommended as the minimum time required for the transition.

The *need* for the changes, now obvious to the fundamentally-able management, proved too much for their patience. They felt that the whole scheme could be launched at once. "We have considered your arguments," they wrote to their advisors, "but do not agree. Our surplus is over $1,000,000 and we see no reason for stretching the program over five years. We are determined to do the job in two." Whereupon they began.

They cut out all jobber business; they increased their sales force; they re-arranged sales quotas; they re-allocated authority. *The project was fine; the strategy was deplorable.*

What followed can be imagined by those familiar with the ramifications of modern merchandising and selling . . . the effect of organizing overnight a merchandising group . . . the consequences of overnight changes in sales management, bases of compensation, field supervision, and sales territories . . . the use of advertising on which the organization could not capitalize . . . the inevitable destruction of morale . . . the insidious trade gossip . . .

Sales declined; profits fell from the $542,000 and $527,000 of the two preceding years to $127,000.

The management became confused; the aggregate consequences of acts good in themselves, floored them. The company floundered . . .

Happily, the business had the reserve power to resist the shock. The following year the profits were $208,000—last year, $406,000 and now, 4 years after the changes were instituted, they are 90% of the previous maximum.

THIS is one of the cases we have studied. From our analyses of business failures and successes we have listed the ten cardinal causes of falling profits—three of which were present in this case.

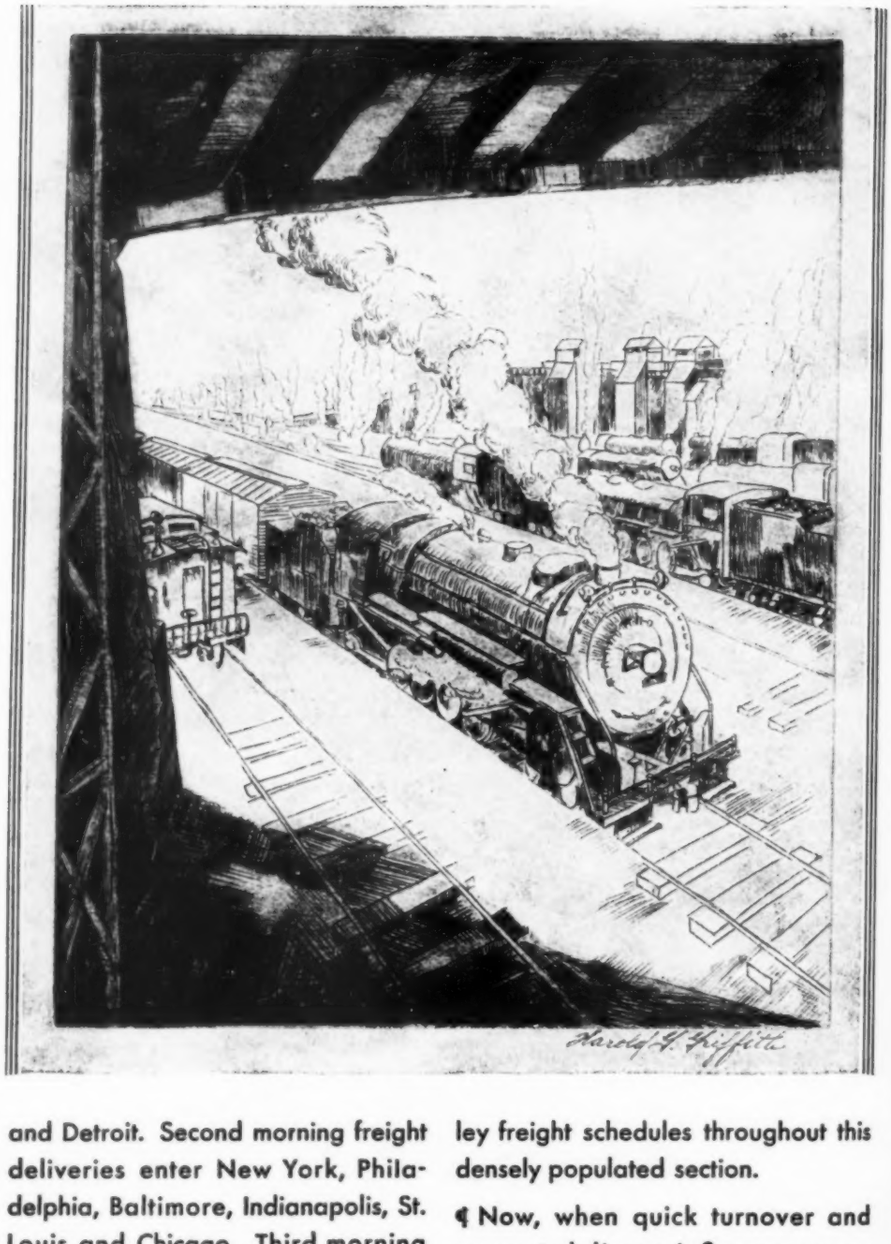
Foreseeing such dangers and averting them, is fostered by our basic Policy: *The policy of performing all the functions of an advertising agency under a plan of operation by which our fee (profit) is divorced from the size or allocation of a client's appropriation.*

It will be seen that such a policy sets no obstacle in the way of a finely balanced, wholly unbiased service.

COWAN & DENGLER

ADVERTISING • MERCHANDISING • SALES COUNSEL

NEW YORK



IF YOU WANT FASTER DISTRIBUTION

CLEVELAND is at the focus of the richest market you can cultivate, and from Cleveland the time element in deliveries works in your favor.

¶ Between closing time at your Cleveland plant and opening time next morning at your customer's place of business, rail freight reaches Buffalo, Pittsburgh, Columbus, Toledo and Detroit. Second morning freight deliveries enter New York, Philadelphia, Baltimore, Indianapolis, St. Louis and Chicago. Third morning freight service covers Boston, Richmond and the Twin Cities.

¶ Cleveland's small package needs are met by established truck service in all directions, and by electric trolley freight schedules throughout this densely populated section.

¶ Now, when quick turnover and prompt delivery influence every order, Cleveland offers outstanding advantages as a distributing center. For specific data regarding distribution facilities at Cleveland, address this Bank.

GUARDIAN TRUST COMPANY

CLEVELAND, OHIO

©G.T.Co. RESOURCES MORE THAN $170,000,000

GARDEN GOLD . . A LATE DISCOVERY

SPACIOUS living, perhaps unfortunately, waits upon an ample income. Money, you will remember, made the mare go. And today the family motor car and the family home are not otherwise than the mare.

Whenever you see a pleasant house, well-kept, furnished in excellent taste, and graciously gardened, you may be certain it is not so except by virtue of a prosperous income.

Gardened . . . perhaps that, more than anything else, is the sign and symbol of prosperity which has flowered into generous living. For when men and women of the better sort acquire a surplus, the first thing they want is a home of their own, with a garden.

AND BECAUSE THIS COUNTRY has fallen heir to unparalleled prosperity, sound and ever growing, gardening has taken on the aspect of a vogue. It has grown with startling rapidity and continues to spread.

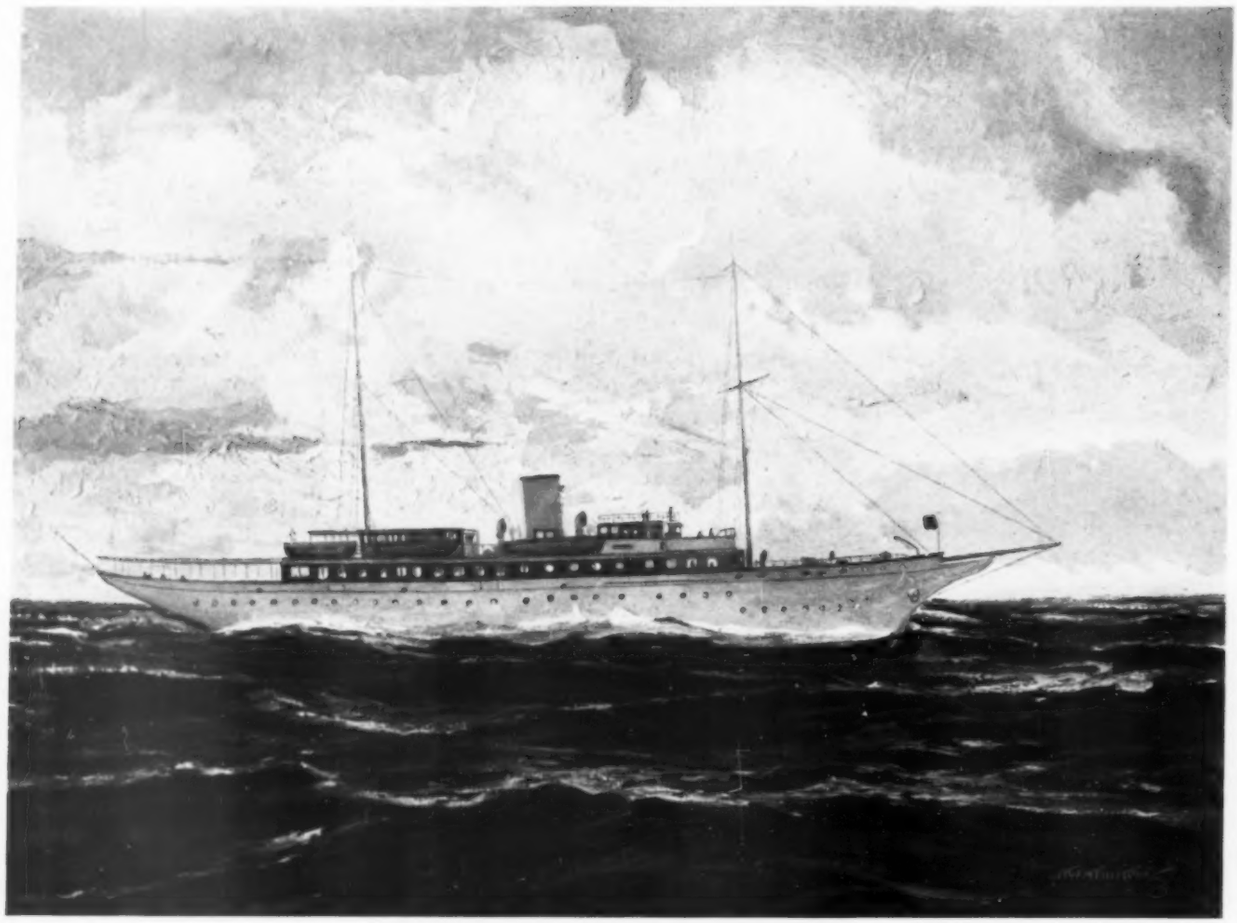
In seven years Better Homes and Gardens has reached, almost without effort, a circulation of a million, three hundred and seventy-five thousand. 85% of these families own their own homes. They subscribed to Better Homes and Gardens almost on sight because it is really different from all other home-making and gardening magazines.

This single circulation—more than six times as large as any other in this field—covers one in every seven of all the owned urban homes in America.

77% of these homes are within the retail trading areas of cities over 25,000.

"HOW-TO-DO-IT" advice on gardening and home-building created this circulation—brought within reach of advertisers this mine of sales possibilities. No forcing methods—just natural healthy growth. Can you think of any reason why you should not be getting your share of this late discovery—Garden Gold?

BETTER HOMES AND GARDENS DES MOINES, IOWA



RENE

No prouder vessel flies the Union Jack than Rene. She is a veritable Queen of the Seas—an ambassadress from America to every foreign port she graces ◂ ◂ ◂ Rene is from the boards of Cox and Stevens, Inc. and John H. Wells, Inc., Naval Architects of New York. Her over-all length is 236 feet, beam 34, depth 19. Power—two 1100 H. P. Winton Diesel Engines. Cruising speed 15 knots. Cruising radius 7000 miles. Among Rene's advanced aids to navigation and control are Sperry stabilizer, gyro compass, radio direction-finder and Fathometer ◂ ◂ ◂ Built by Pusey & Jones for the Rene Corporation, New York.

Distinguished yachts recently launched at the yards of The Pusey and Jones Corporation

NAKHODA

Length 236 feet

Owner:
FRED J. FISHER, Esq., NEW YORK

Architects:
COX & STEVENS, Inc. JOHN H. WELLS, Inc.

◂ ◂ ◂

CAMBRIONA

Length 256 feet

Owner:
W. O. BRIGGS, Esq., DETROIT

Architects:
COX & STEVENS, Inc. JOHN H. WELLS, Inc.

◂ ◂ ◂

LOTOSLAND

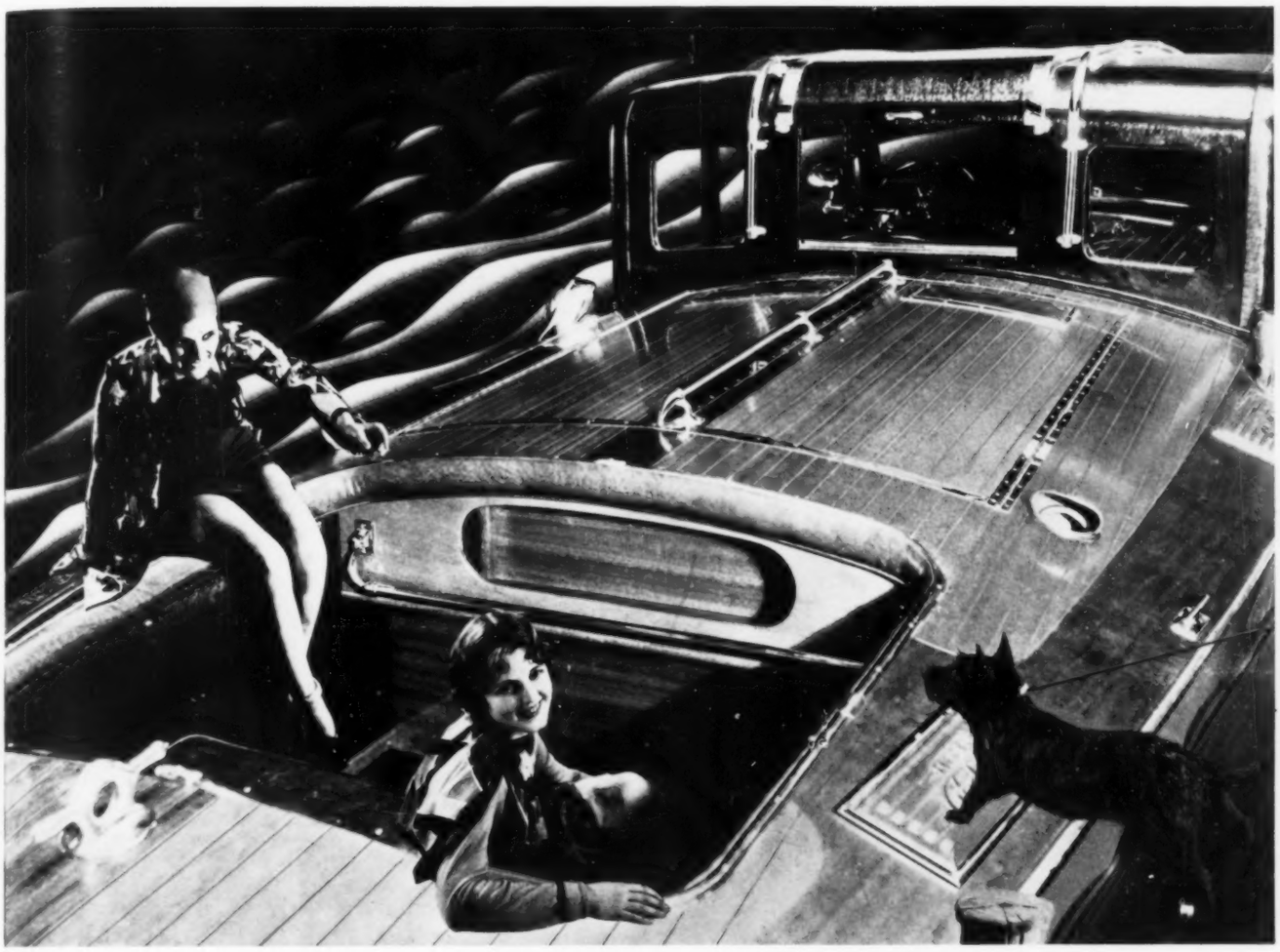
Length 204 feet

Owner:
E. A. DEEDS, Esq., DAYTON

Architects:
COX & STEVENS, Inc.

THE PUSEY AND JONES CORPORATION

Shipbuilders Since 1848—WILMINGTON, DELAWARE



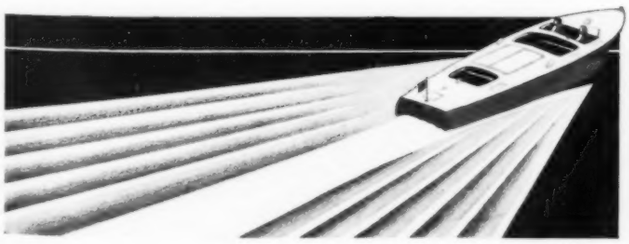
"COME ON, LET'S GO!"

Will there be a Gar Wood at your wharf this summer? It's time now to think of how much such a boat will give to your play-days, to the delight and comfort of the whole family.

Every Gar Wood boat is kin to the famous Miss Americas. Designed and built by the very same craftsmen.

Poised, eager to go, your Gar Wood answers every whim. Ready to whisk you over limpid moon-lit waters, to slip cleanly through the chop, to soar over the long swells, with the gale or in the eye of it—with equal nonchalance.

All 12 of the new Gar Wood models are delightful performers. The variety of types, open and closed, and including the fastest stock boat built, assures you of just the sort of craft you can enjoy to the utmost. You will be interested in the details. Your request will bring a handsome booklet post-haste.



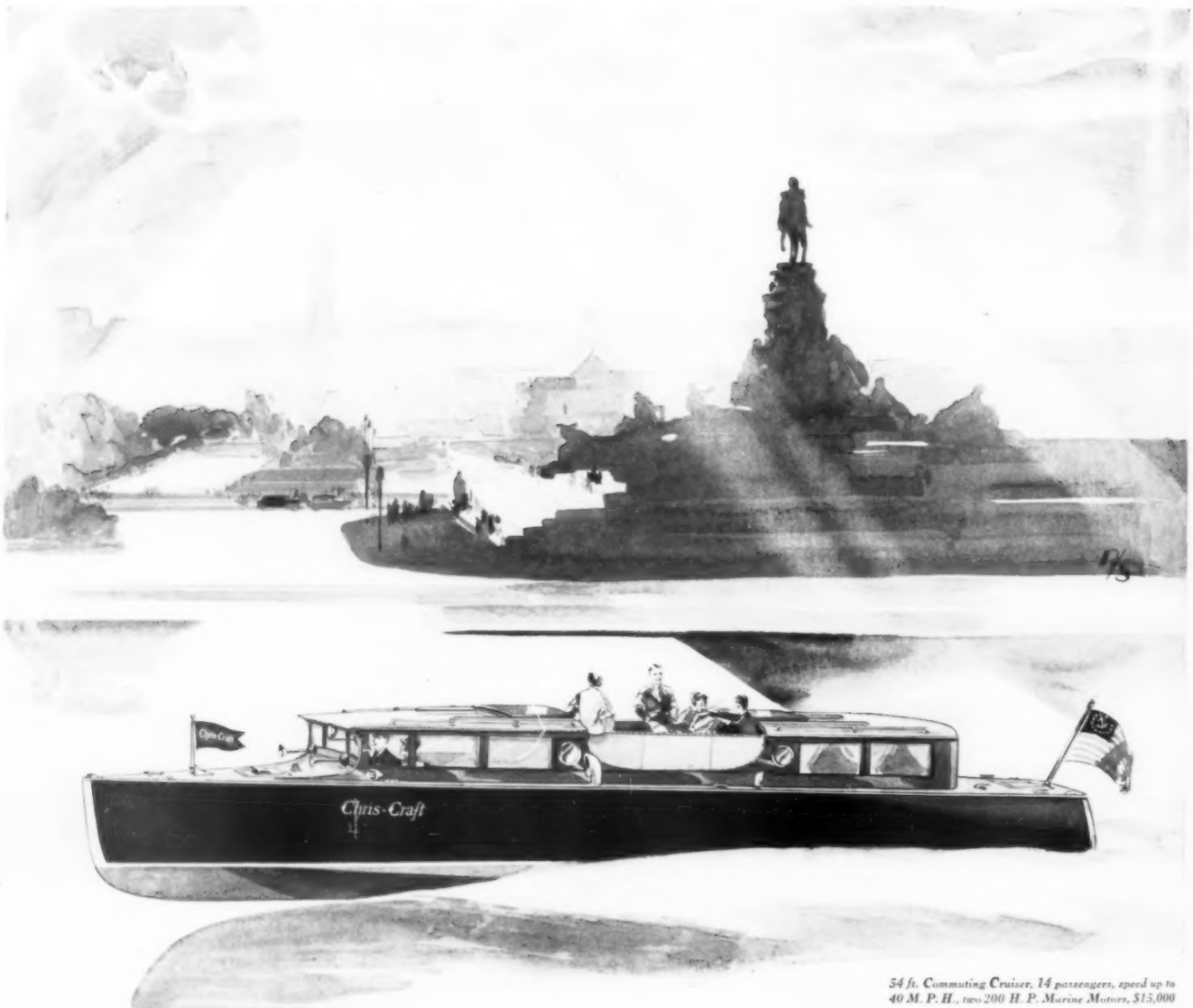
Twelve New Models—30-55 m. p. h. $3,150 - $12,950

GAR WOOD INC.

THE GREATEST NAME IN MOTORBOATING

206 River Road
Marysville, Michigan.

Factory Branch
1860 Broadway, N. Y. C.



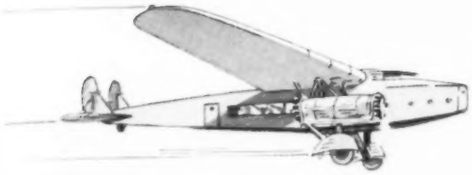
54 ft. Commuting Cruiser, 14 passengers, speed up to 40 M. P. H., two 200 H. P. Marine Motors, $15,000

WHAT a way to entertain—the Chris-Craft way! So fast is Chris-Craft—so safe and so luxurious—it brings within reach the sports and recreations of the whole coastline! Every Chris-Craft inevitably becomes a social center. Whole parties may go in restful luxury at express train speed to distant regatta, dinner or dance—to sports and recreations everywhere on water ' ' ' With a Chris-Craft you find yourself more frequently invited and more frequently inviting social contacts with really worth-while folks. The boating set is a cheery, happy family, socially active and socially worth-while. Industrial leaders, statesmen and bankers find Chris-Craft the means to secure needed rest and recreation in limited time ' ' ' Let Chris-Craft solve your recreation and entertainment problem. Between the nimble twenty-foot runabout and the stately Chris-Craft yacht is the widest range of pleasure craft ever offered. All are luxuriously cushioned, all are seaworthy, safe and fast. All have automobile type controls and starting, lighting and steering devices. Chris-Craft merchants throughout the world will demonstrate and describe the various models. Illustrated catalog may be had by writing Chris Smith & Sons Boat Co., 124 Detroit Road, Algonac, Michigan.

Chris-Craft

World's Largest Builders of All-Mahogany Motor Boats

Runabouts—Sedans—Commuters—Cruisers—Yachts
24 Models—20 to 48 feet—$1895 to $55,000



The last word in the science of aviation is spelled F-O-K-K-E-R

GENIUS is not too grand a word for the art of Anthony H. G. Fokker as expressed in the design and construction of the modern airplane. He has built more planes than has any other man or organization on earth. His planes have made twice as many pioneering long-distance and trans-oceanic flights as have any other make. They have flown more than *twenty-five million miles* on regular transport schedules, establishing records for safety and dependability that have never been approached.

Now the genius of Anthony H. G. Fokker is supported by the vast technical and productive abilities of General Motors Corporation. The thoughtful man will know how to give that simple statement the rich significance it deserves. It means that whether you operate, fly or merely ride in an airplane, you can count on that airplane embodying the last word in the science of aviation if it bears the name Fokker. It means that more than ever the airwise now select Fokker as the plane on which they can unhesitatingly rely.

Fokker manufacture now includes ten different models of airplanes: single and multi-engined types, land planes, sea planes, flying boats, amphibians. Requests for information or demonstration are invited, and will be promptly answered. Fokker Aircraft Corporation of America, General Motors Building, New York.

FOKKER

AFFILIATED WITH GENERAL MOTORS CORPORATION

Cause

GOODYEAR has always believed that a superior product, honestly made and sold, is better policy than any seeming expedient.

Even in the early days, therefore, when Goodyear was a small company, it declined to resort to the definite mileage guarantee as a means of increased sales.

All tires are run under varying conditions of speed, road, load, and service, and since these variables greatly affect the life of a tire, a uniform mileage guarantee can only penalize the man who uses his tires properly, while benefiting the man who does not.

Goodyear has won to world leadership not by employing any expedient guarantee, but by putting every possible value into the tire itself, and by standing behind *every* Goodyear tire as being of a quality which will protect our good name.

F. A. Litchfield
President

GOOD

Result

Goodyear annual production of motor vehicle pneumatic tires

YEAR	TIRES
1902	4,476
1903	7,781
1904	6,666
1905	12,626
1906	23,712
1907	28,307
1908	35,282
1909	94,200
1910	261,888
1911	420,255
1912	1,084,134
1913	1,281,487
1914	1,788,484
1915	2,656,588
★ 1916	4,118,399
★ 1917	5,880,544
★ 1918	3,790,212
★ 1919	8,137,353
★ 1920	6,863,140
★ 1921	5,152,503
★ 1922	7,887,243
★ 1923	9,119,335
★ 1924	10,056,437
★ 1925	12,458,144
★ 1926	13,781,714
★ 1927	16,002,630
★ 1928	21,575,945
★ 1929	23,063,150
Total	155,592,635

★ Largest annual production of any rubber company in the world

YEAR

Copyright 1930, by The Goodyear Tire & Rubber Co., Inc.

PACKARD

LUXURIOUS TRANSPORTATION

In the England of Lady Hamilton's day the light open carriage, ingeniously fashioned and richly upholstered, was the favorite vehicle of gentlefolk

* * *

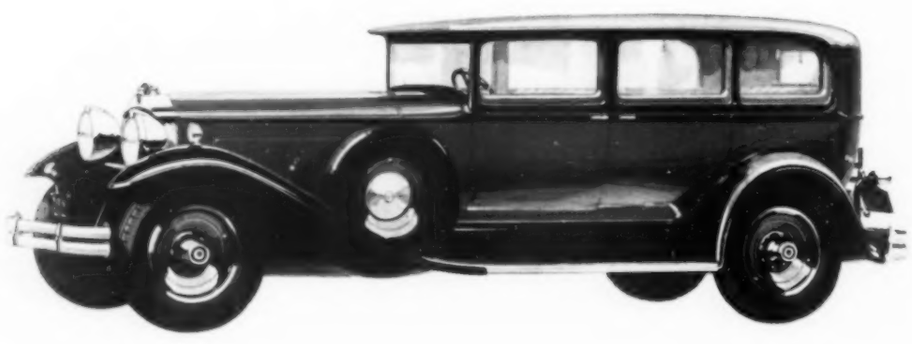
Each year Packard has made truly luxurious transportation available to more thousands of those who want the best. Today Packard transportation is within the financial reach of all those who have been accustomed to paying fifteen hundred dollars or more for their motor cars.

For him whose means permit the utmost in motor car elegance there is, of course, the Packard Eight De Luxe—and the Custom Eight. But Packard's ever-growing sales rest chiefly upon the Standard Eight, the car that has made possible the widest enjoyment of Packard comfort, beauty and distinction.

Though smaller than the costlier Custom and De Luxe models, the Packard Standard Eight is still a large and roomy car—complete in every luxurious detail. Fast and powerful, too, with its famous eight-in-line motor. And above all it is a Packard—in quality as well as in distinguished appearance.

It really costs no more to own a Packard Standard Eight than many a lower-priced vehicle. Operating costs are no greater. And the higher first cost is offset by the longer period the owner gladly keeps his Packard.

ASK THE MAN WHO OWNS ONE



Volume 1 **Fortune** Number 3

Contents for April 1930

Circus 39
Ringling 44
Oil 46
The Texas 49
Prospecting 51
Drilling 52
Refining 55
Shipping 58
Piping 59
Map 60
Menu 62
G. M. Executives 64
Copper 70
Hill 71
Jackling 73
Portfolio 75
Aviation 80
Elgin 88
Leviathan 92
$50,000 104
Grigsby-Grunow 109
Buckingham Palace . . . 110
Gillette 112

• • • • •

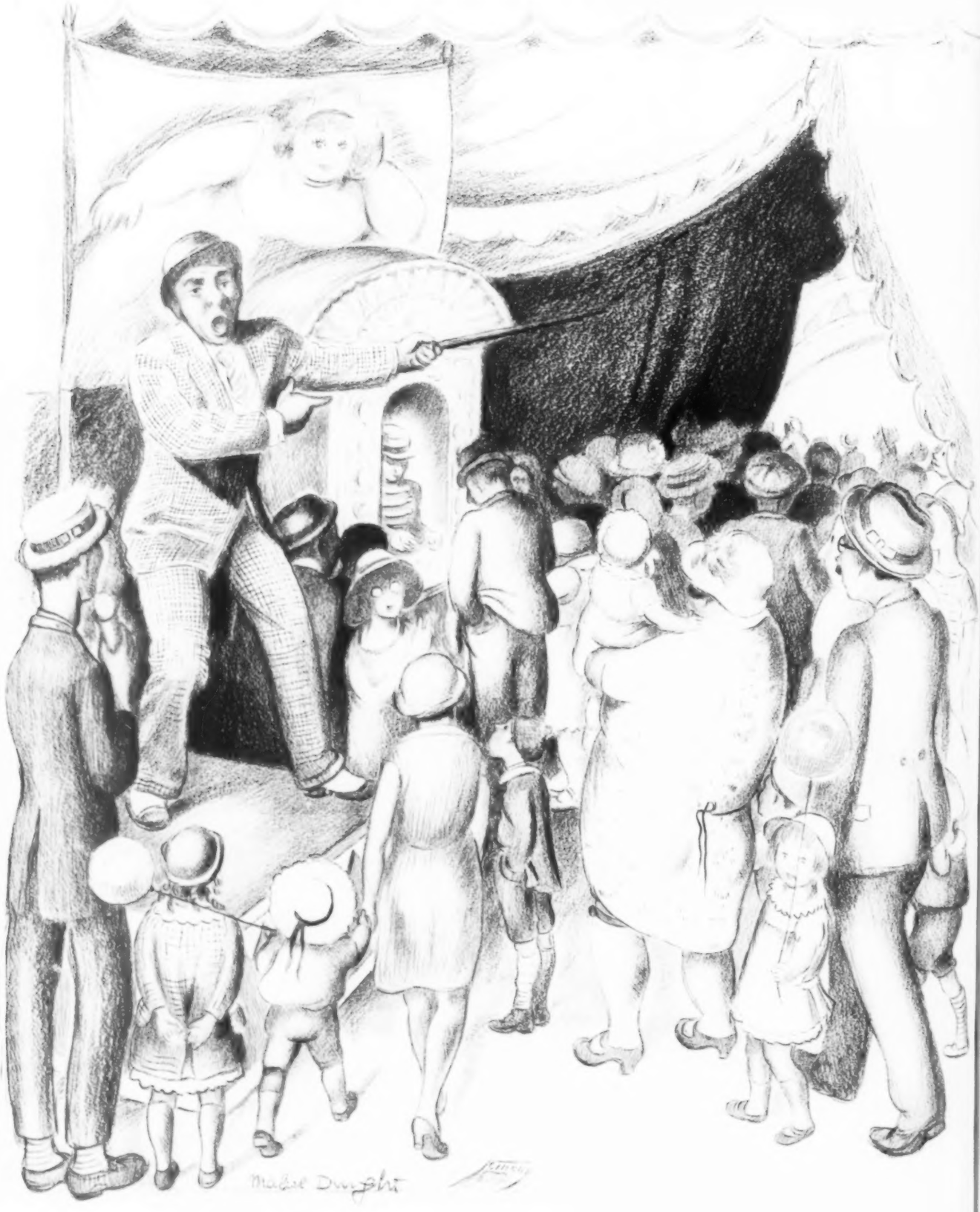
Off the Record 10
Statistics 20
Faces 99
Transactions 115
Appendix 146

for May

Paper · · · Gold · · · Herds
London Times · · · · · · · New York Times
R. H. Macy · · · · Vanderbilts · · · · · · · Wine

Editor, Henry R. Luce; Managing Editor, Parker Lloyd-Smith; Art Editor, T. M. Cleland. Associates: John Shaw Billings, Margaret Bourke-White, L. S. Goldsborough, Wilder Hobson, Florence Horn, Alan Jackson, E. D. Kennedy, Dwight Macdonald, John S. Martin, Charles L. Stillman, Eleanor Treacy, Myron Weiss. FORTUNE is published monthly by TIME, INC: Henry R. Luce, President; R. L. Johnson, Roy E. Larsen, Vice Presidents. Publication Office, 205 East 42nd St., New York City. Yearly subscription rate, $10. Single copy price, $1. Advertising Manager, F. Du Sossoit Duke.

Copyright 1930 by TIME, Inc. All rights reserved under the Convention on Literary and Artistic Copyrights between the U. S. A. and the Argentine Republic and other countries proclaimed July 13th, 1914.


Mabel Dwight

To Make a Circus Pay

Is harder than catching giraffes—it's one man's secret

ONE of the very best ways to lose a lot of money and lose it quickly is to start a circus. In the 163 years of American circus history, the accuracy of that statement has been challenged by hundreds of men and millions of dollars. Again and again it has been proved true. Some circuses have thrived through a lifetime; some have floundered for a week; some have been large and elaborate outfits; some have been scarcely more than peep shows. With less than a dozen exceptions they have all, in the circus phrase, "come a patsy." (Circus words and circus phrases, without which no circus story can be told, will be found in a glossary in the appendix.) Only a half dozen survive today as successful organizations. One and only one, Ringling Bros. and Barnum & Bailey Combined Shows, indisputably the greatest show on earth, has achieved magnitude, stability, commercial significance.

Circus is animals. Circus is "art." Circus is rolling stock and big top, razorback and band. Circus is everything you can see and hear upon the lot—and one thing more. It is the thing that the hundreds of men who have come a patsy in circus have lacked.

The *thing* is not a big name. There was the case of Coup & Lent's New United Monster Shows to prove that. W. C. Coup was Barnum's first partner, originator of the railroad circus, proprietor for years of a consistently popular show. L. B. Lent built up in the heart of New York City a circus "first class in every respect and financially a success." He toured the country with it until his death. These two names, among the best known in Circus, glistening in fresh paint on wagon and car, riding on pennants above the big top on old familiar stands, ought to fill up the "blues." It set out in the spring of 1916, a twenty-car outfit (the railroad car is the yardstick of the circus) under the direction of L. J. Stark, a seasoned showman. On the twenty-eighth of August, just past midseason, it failed.

Gollmar Bros. Circus, a new name in 1891 but a popular one by 1916, went out under new but experienced direction in 1917. It failed in a year. Ballard, Mugivan & Bowers, impresarios extraordinary of circusdom, put out a well-equipped and well-advertised circus under the Gollmar ægis in 1922. It had, in the laconic phrase of John M. Kelley, "a losing, disappointing season." Incidentally, John M. Kelley is the brusque, bald, able lawyer for the Ringling shows and the compiler of the only authoritative record of circus successes and failures. It is a brief which was presented in the settlement of the estates of Henry and Alf T. Ringling. All circus men know of it; few have ever seen it. It is a circus *Book of the Dead*. In it are recorded the scores upon scores of circus patsies of the last hundred years: the Buffalo Bills, Sellses, Coles, Forepaughs, Robinsons, Paddy Ryans, Sipes, Blakes, Bostocks, Sangers, Stones, Costellos, Ameses, Rices that have taken the road as five-, ten-, or twenty-car circuses and have failed entirely or have accepted gladly the opportunity of being gobbled up by some other. The inevitable conclusion of one who reads the brief is that the circus has been more consistently productive of ruin than has any other commercial enterprise.

The *thing*, again, is not perseverance. The same Stark who "took a fall" with Coup & Lent's in 1916 demonstrated the inadequacy of perseverance per se with the same outfit in 1917. This time the posters read Coup & Lent's Enormous Shows United. This time it failed on the seventh of July, seven weeks earlier in the season than it had in 1916.

The *thing* is not more money when wet tops or other misfortunes follow the circus. Coup & Lent's proceeded *immediately* to demonstrate that. Backed

with $100,000 raised by a syndicate in which a Cedar Rapids, Iowa, bank (already a creditor) participated, Coup & Lent's took the road again on the eighth, died dismally and completely at Connellsville, Pennsylvania, on the eleventh, ruining the creditor bank, driving one bank official to suicide.

The *thing* is not good will. Lawyer Kelley drew up his brief to show that there is no such thing as good will in the circus business. The late H. H. Tammen, notorious as ex-bartender of Denver's Windsor Hotel and as publisher of the old Denver *Post*, a shrewd man and a habitual promoter, joined with Willie Sells in 1905 to organize the Sells-Floto circus. When Sells-Floto was sold (as were a great many others in that year) to Ballard, Mugivan & Bowers in 1921, Tammen said, "I was in the circus business for nineteen years . . . When we concluded to get out . . . and endeavored to find a buyer, it took us a year to find one and then we received about $219,000 for the property. I know the property was itself worth more than that; then I began to argue about the good will, the value of nineteen years of advertising . . . I got nothing in the world for the good will, and the physical property that the purchaser got cost me considerably more than I received for it.

"We also owned the Buffalo Bill's Wild West and Congress of Rough Riders of the World title, for which I paid $20,000 and that was thrown into the bargain . . ."

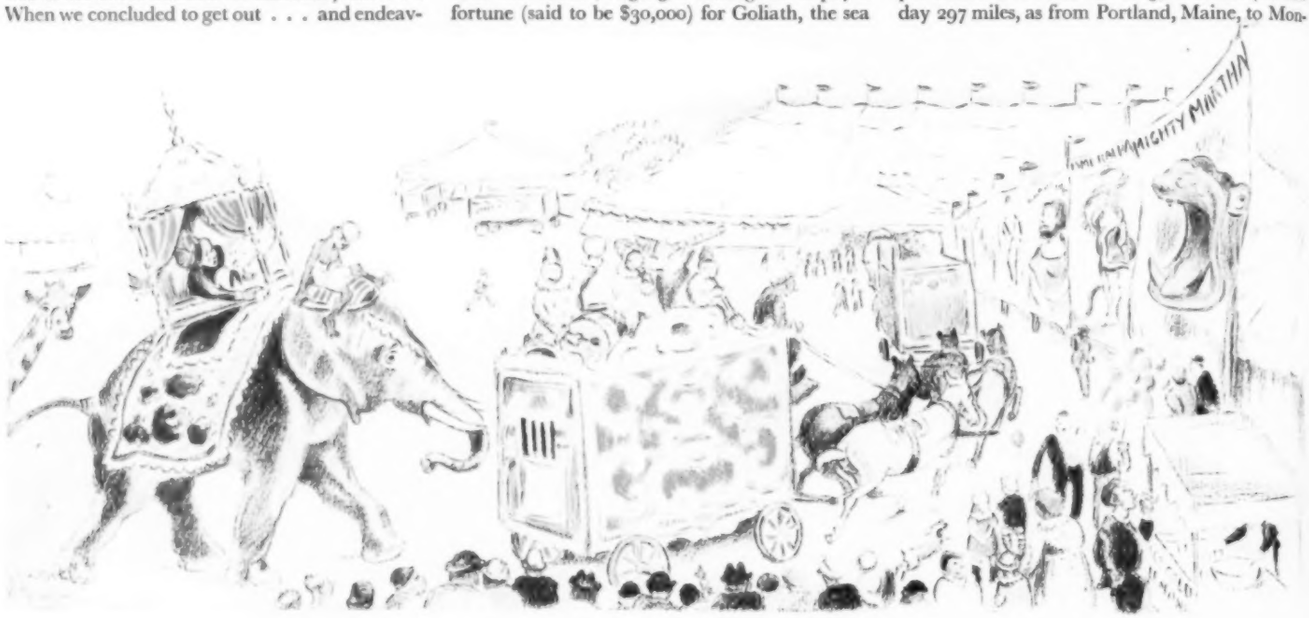
BUT—there does stand one colossal contradiction to all well-tabulated evidence that no one can make a big thing of Circus. One great American fortune has been amassed in this precarious enterprise, the $50,000,000 plus of John Ringling. During the last forty-six years, while the foregoing commercial tragedies were being enacted, working with similar equipment (some of it identical, purchased from patsies), this Ringling Bros. and Barnum & Bailey snowball has been rolling uphill, growing at each revolution, attaining at last and beyond dispute the rank of greatest show on earth. The fortune has proved sufficient to buy a small railroad here and there, sink oil wells now and then, buy fine paintings (and just paintings), a mansion on Fifth Avenue, an estate in New Jersey, and a Venetian palazzo in Florida. And, in September, 1929, to buy out in one magnificent gesture the only five Ringling competitors worthy of notice.

This circus had the *thing*. A generation ago the *thing* might be called *barnum*. But *barnum* is not enough to assure the success of the 20th century circus. Nowadays, one needs *ringling*. *Ringling* is infinite capacity for detail and for organization; *ringling* is forty-odd seasons with at least one Ringling brother on the lot at each performance; *ringling* is knowing the length of every railroad siding in the country and knowing railroad men by their first names; *ringling* is willingness to pay a fortune (said to be $30,000) for Goliath, the sea elephant, though no one thought the animal could survive two weeks of circus travel. This is *barnum* times infinity. Given the capital, the art, the rolling stock, the punks, the tops, the razorbacks, and sufficient *ringling*, one may, perhaps, today pay dividends on circus investment.

The first Ringling circus opened on May 19, 1884, at Baraboo, Wisconsin. Its main tent canvas (no one today would call it a big top) measured forty-five by ninety feet, its side show tent, thirty by forty-five. It had twenty-two horses and eleven wagons, no band wagon, no menagerie, no wild animals.

Today, billed under the least elaborate name it has ever used, the Ringling Bros. and Barnum & Bailey Combined Shows (gone the "greatest," gone the "enormous," "monster," "stupendous," "universal," "spectacular," all of which have done time in the Ringling name), "Mr. John's" circus has, among other things: a pay roll of more than 1,600 people; 735 horses and more than 1,000 other animals; 100 double-length railroad cars; over 100 cages, dens, tanks, pens, and lairs; its own doctors, lawyers, dentists, detectives, chefs, cooks, waiters, power plant; over 60 children who travel with it, attending school as they go, reciting to teachers paid by the circus; a seating capacity, when on the road, of 15,000. It consumes in a day: 300 pounds of butter, 300 gallons of milk, 200 pounds of coffee, 35 bags of table salt, 2,500 pounds of fresh meat, 2,000 loaves of bread, 250 dozen eggs, 1,500 pounds of vegetables, 2 barrels of sugar, 50 pounds of lard, 100 dozen oranges, 50 tons of hay, 20 tons of straw, 350 bushels of oats, 4 cords of wood, all bought in local markets. Nearly 5,000 meals are served every day in the cookhouse. (When pancakes are on the breakfast menu, more than 10,000 are eaten.)

In a season it will give 400 performances before a total of about 4,000,000 people. It will gross about $6,000,000, including income from side shows and concessions, an average of $1.50 per customer. It will travel 15,000 miles (on one day 297 miles, as from Portland, Maine, to Montreal, Canada; on another, 10 miles, as from Newark, New Jersey, to Jersey City). It will spend each day about $18,500, a great deal of it in local markets.



It has been valued officially and conservatively at more than $3,000,000.

And it has John Ringling, "Mr. John," as he is universally known in the business, last surviving of the five proprietors (besides him, Al., Alf. T., Otto, and Charles) of the original Yankee Robinson and Ringling Bros. Great Double Shows, Circus and Caravan. (The widow of brother Charles, and Richard T., son of brother Alf. T., each own a part of Ringling Bros. and Barnum & Bailey, but do not share in Mr. John's other circus holdings.)

There has never been another hundred-car circus. There has never been another so successful. But Mr. John until last autumn had a rival—the American Circus Corporation, the cerberus Ballard, Mugivan & Bowers. The story of Circus, or of Mr. John, cannot be told without mention of them.

When the Ringling show was known as Ringling Bros. World's Greatest Shows and Spectacle,

Jerusalem and the Crusades (that is, in 1904, three years before their purchase of the Barnum & Bailey Greatest Show on Earth) Jeremiah Joseph ("Jerry") Mugivan and Bert Bowers, one time ticket takers for the Sanger & Lenz Show, organized a circus of their own: the Great Van Amburg Show. The firm of Mugivan & Bowers (or, as it shortly became upon the admission of Ed. Ballard, proprietor of the West Baden Hotel, West Baden, Indiana, Ballard, Mugivan & Bowers) was thereafter continuously in the circus business as a major owning and promoting triumvirate. The involution of their holdings were many; even circus people were surprised at the list which appeared in the *Billboard* when Jerry Mugivan died on January 22 of this year.

In 1921 they formed the American Circus Corporation. This chain of holdings, consolidated a year ago into five circuses under the names of Sells-Floto, Hagenbeck-Wallace, John Robinson, Sparks, and Al G. Barnes (the last two acquired in the winter of 1928), was able to challenge the power of Mr. John, though none of the five units could challenge the prestige of Mr. John's hundred-car organization. Mr. John did not mind. There are enough towns to go around. Mr. John can only visit about 150 in a season, and every town wants a circus. There is just one thing which Mr. John will permit to no rival. Mr. John opens the circus season, and he opens it at Madison Square Garden. For a generation there has not been a year in which neither the name of Barnum & Bailey nor Ringling Bros. has appeared on its hoardings.

And this spring, as always, Ringling Bros. and Barnum & Bailey Combined Shows is coming to the Garden. But thereby most decidedly hangs a tale. A tale of long arguments and hot words in the offices of the Garden management. The tale of the demise of the American Circus Corporation.

Madison Square Garden was built as a temple to the padded glove, and Mr. John helped to build it. One of Mr. John's most famous discoveries, Tex Rickard, until he died, was the catalyst of most Garden activity, and he was boxing's high priest. Nevertheless, the Garden in April is Mr. John's. At least, so thought Mr. John, and so thought the public.

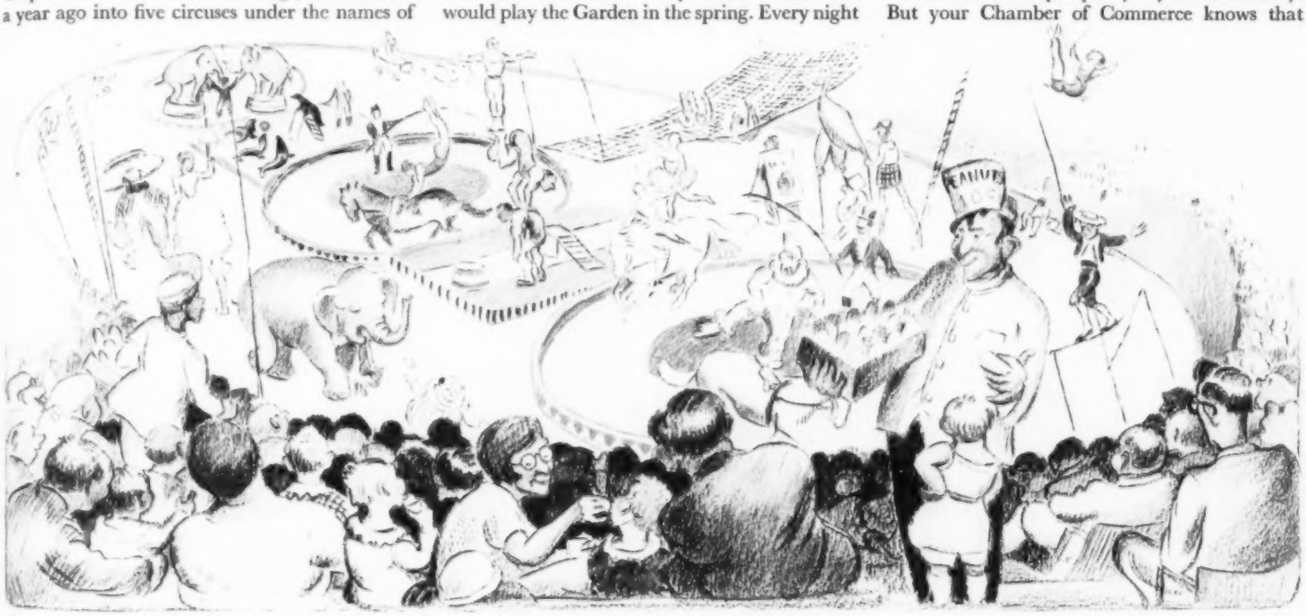
But Mr. John and the public found that they were in the minority. The other Madison Square Garden directors declared flatly and finally to Mr. John, "You cannot bring your three asterisk circus into the Garden unless you agree to fold it up each week on Friday and let us put on a fight. You cost us important money last year, sixty grand at least." Mr. John would not agree. The contract went unsigned into the wastebasket.

Mr. John said he would open his season in the old Twenty-second Armory. The deal was almost consumated when it became known that the Garden officials had made an agreement with the American Circus Corporation. Sells-Floto would play the Garden in the spring. Every night but Friday night. And that was the end of the American Circus Corporation. The following morning the 150 cars, 4,500 people, 2,000 animals, tents, baggage stock, names, in fact, the entire peculiar civilization of their five shows belonged to Mr. John. A circus man who would say to Mr. John, "I'm playing the Garden next year," must smile when he says it.

So Mr. John now has six front rank circuses and four or five carnival outfits—almost $10,000,000 worth. Big business. All routings made from a single office. All profits to Mr. John alone (excepting only the share of Mrs. Charles and Richard T. in the profits of the Ringling Bros. and Barnum & Bailey unit.) It is a monopoly, but the half-voiced threat of procedure against Mr. John under the Sherman Law brought only laughter from those who had stopped to think that Mr. John is not selling anything but entertainment, that it has always been the boast of menagerists that their function is primarily educational, that restraint of trade, price-fixing, and the other high crimes of trusts have certainly not been committed by Mr. John.

From your seat in Madison Square Garden or the Chicago Coliseum or under the big top on the Kansas prairie, you will not detect any difference in the circus, no matter which of the six you see. Sells-Floto, for example, will still be Sells-Floto. Going Big Business has not meant mechanization or regimentation in any visible degree. The death-defying leaps and the whirlings of acrobats will make your eyes start from your head as always. Sequined ladies will spring from tanbark to pad to tanbark just as in the days when you craned your neck to see over the head of the grown-up in front of you on the blues. You will not realize that it is a business—that part of Circus is behind the scenes, before circus day.

For example, you are not apt to reflect that the presence of the Ringling Bros. and Barnum & Bailey Combined Shows at the fairgrounds is a certification of the prosperity of your community. But your Chamber of Commerce knows that Ringling statisticians have been checking on employment conditions, crop prospects, bank deposits, rail facilities, road conditions for months past. If these did not measure up to Ringling requirements, Mr. John would have gone right by you. Nor are the reports upon which he bases his operations out of date. The route of the circus may be changed a dozen times during the season. The advance car which precedes the circus by a month over a tentative routing is in constant contact with Sarasota, Florida, headquarters. The reports of advance men may change the route completely. For this reason, the circus performer when he starts out in the spring does not know what towns he will visit before he starts playing the halls in November. New itinerary slips are posted in the cookhouse at monthly intervals. When next month's route is posted, hundreds of post cards are sped homeward, reading, "Having a swell season. Feeling fine. Write soon, Greeley 6th, Laramie 7th, Cheyenne 8th, Wheatland 9th, Douglas 10th. Wish you was here. Take care of yourself. The new high-school act is sure getting 'em up in our laps. Will close with love to all."



Mr. John has a circus factory also at his winter quarters in Sarasota, Florida. This summer, while the circus is on the road, next year's big top will be made. A new one is provided every year. One hundred and fifty thousand dollars' worth of materials and labor go into the making of this, the largest stretch of canvas ever raised, the central roof of a twenty-acre colony.

Although it is a perfectly good tent in the fall, a brand new one will go out in the spring, twenty-five feet longer than it will come home at the season's end, so much does it shrink in the summer rains. Mr. John prides himself as do his canvasmen that once his big top is pitched, it is never in danger of blowing down; its roof does not leak. And this in spite of the fact that it is always up within an hour of the arrival on the siding of the last section of the circus train, is in each twenty-four hours taken down, packed, portaged, unpacked, and raised again between midnight and midmorning.

A crew of sailmakers is constantly employed at Sarasota making tents. There are also wheelwrights, smiths, painters, and mechanics of all kinds repairing and building equipment.

Preceding the circus a day is the twenty-four-hour-man, the last purely business representative of Mr. John to call. He arrives in time to check up on the delivery of hay, beef, ice, bread, oats, sugar—all the commodities that the crew of 1,600 consume in three meals. He checks up on the condition of the grounds and the roads between the siding and the stand. Until very recent years he had also to make certain that the arrangements for the Monster Street Parade Daily, 3—Miles Long—3, were all in order. But the street parade is no more, and the twenty-four-hour-man has more time to sleep.

Hundreds of times Mr. John has been asked, "Why did you do it?" The answer is obvious. The Monster Street Parade Daily was pushed off the street by the home talent parade of Fords and Packards, Macks and Whites that is in every town in America. Horses always shied at the bulls. Horses, therefore, were always tethered on another street, and the spectators walked to the curbstone. Flivvers do not shy. They park along the line of march, jam intersections, honk and sputter and retard the procession. Mr. John gave up.

The circus has not suffered in the least by the abandonment of the parade. There are indications to the contrary. Kibitzers seem to have been discovered—curbstone parade watchers who never went to the circus grounds. But this finding is hardly demonstrable, so greatly has the radius of each performance been widened by the very motor which drove the parade from the street. Two capacity audiences (15,000 each) have been entertained in a day in a village of 400 population. John Farmer can now finish his evening chores, hop into his sleek or dilapidated car, and drive twenty, thirty, forty miles to the circus grounds in time for the evening show, get home after it before cockcrow.

The question, "Why don't you have any more parades?" is the first new circus question that the inquisitive American has thought up in a good many years. Seemingly there is no other business that so provokes the curiosity of people whose it is not. Answers to some of these favorite questions have been secured and follow.

WHENCE COME RING HORSES?

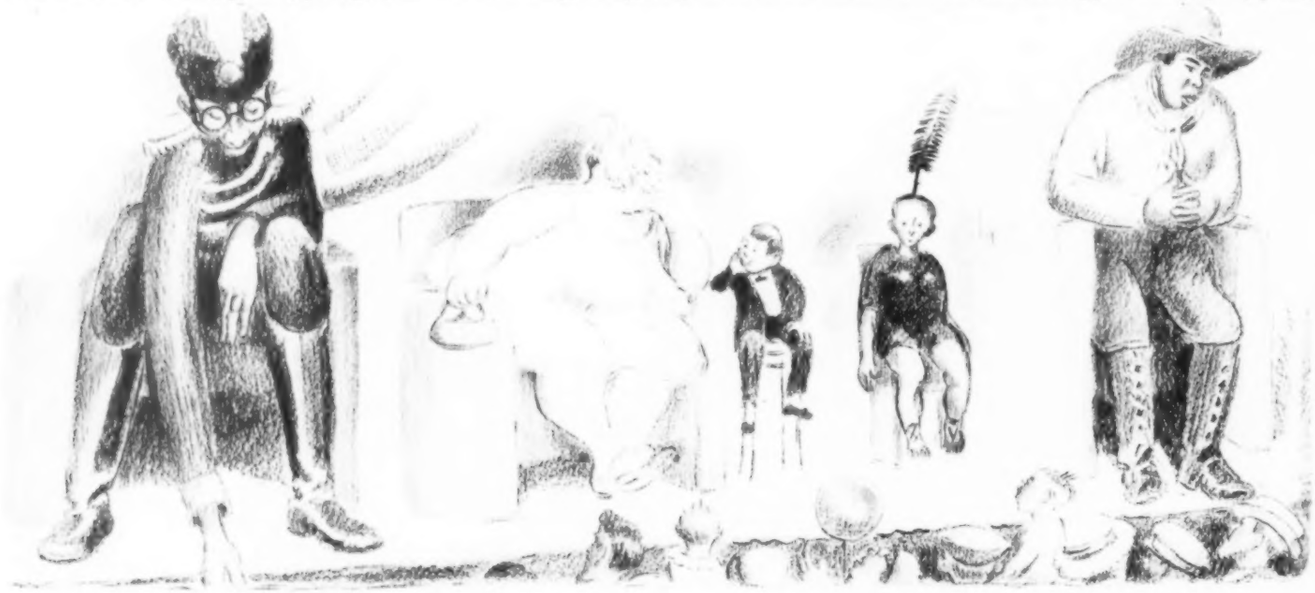
Most pad and bareback horses come from barnyards in the circus's line of march. They are always shorter than average from shoulder to flank, and their backs must be wide. A good pad mount appears to the novice almost sway-backed. That sag in his spine is built up with resin and padding, protecting his back and making the rider's footing safer. Put into rehearsal in a line of trained animals who lope around the ring, he soon knows his business.

"High-school horses" are usually picked up just as casually, but not usually by the trouping circus. They are selected for intelligence and build by trainers who may never appear on the road. When a group is trained, it is sold with cues to the most eager customer.

Equine mathematicians are trained to perform some simple motion, such as tapping with a forefoot upon a tub, just as doggedly as a pad horse trots around the ring. This he will do until his trainer moves. The trainer stands stock-still until the proper number of taps have been made and then, by moving hand or foot or head, signals the horse to stop.

ARE THE FREAKS BONA FIDE FREAKS?

For the most part, yes, though many a "wild man from Borneo" is an unusually vicious looking South Carolina Negro shrewdly capitalizing his queer appearance. The famous "missing link" so long and so profitably exhibited was actually an American Negro so peculiar in appearance that she could not support herself by any prosaic means. Exhibited as a speechless subhuman, she was actually a very well educated woman, knew long passages of the Bible and much of Shakespeare by heart. When she died she left a ponderable estate.



The rather common assumption that all freaks are subnormal and greatly to be pitied is not well founded. At least two of the human exhibits in Ringling Bros. and Barnum & Bailey's side show are uncommonly shrewd, amply able to handle their affairs, and earning large incomes. In both cases their natural peculiarities are wilfully exaggerated, and impressive mannerisms are assumed for the benefit of the crowds that gape.

Freaks are bona fide freaks in a measure to begin with, and such lily-gilding as is resorted to is for the amusement of the onlookers, who would not have it otherwise.

HOW ARE THE FREAKS PROCURED?

Many a freak applies for admittance to the side show colony as another person would apply for a position as stenographer or salesman. Many are imported from such agencies as Hagenbeck's at

Stellingen, the groups of rare racial types that periodically tour the land usually coming in this way to the American circus. Still others are discovered and reported by fellow-townsmen, who commonly try to exact good commissions for their services. There is amazingly little mystery about the freak. He is, logically, holding down the job for which he is best fitted. He makes a good living and has, in most instances, far more comfortable surroundings than he could provide for himself otherwise.

DO ANIMALS BREED IN CAPTIVITY?

Some do and some do not. Members of the cat family are the most prolific, lions, tigers, and panthers frequently presenting their owners with cubs which may grow up to be of great exhibition value. But of elephant calves only two or three have been born and successfully reared in America. Such an event is so rare that upon the occasion of the birth of one calf at Barnum & Bailey's old winter quarters in Bridgeport, Connecticut, the medical fraternity attended in large numbers to witness the event. A peculiarity of elephant breeding is that if the calf is male, the period of gestation is sixteen months; if female, eighteen to twenty.

Monkeys, it is surprising to learn, very rarely breed in captivity. John T. Benson, Hagenbeck's American agent, certainly the largest monkey dealer in the United States, doubts if more than a half dozen monkeys were born in the country during the last year. All of the hundreds which he sells to circuses, zoos, pet shops, and research laboratories are captured in the bush.

HOW IS THE GIRAFFE CAPTURED?

No other animal, once he is located, is more difficult to capture and deliver. There is only one season of the year during which he may be captured at all. Just what that season is, no giraffe catcher will reveal. That is his trade secret.

At the proper time, a crew of perhaps forty beaters, a half dozen bullock carts, forty or fifty bullocks, and twenty or thirty goats will set out from the base. They will travel 150 to 200 miles before they reach the giraffe country at about four miles an hour. One day they will sight a herd. In it there may be twelve animals. Of the twelve, perhaps six will be sixteen-foot-high adults, too old and too big to transport. Another three will have blemishes that make them worthless to the dealer. Of the remaining three, one or all may die of fright during capture, so delicate is the giraffe heart, so brittle its neck and legs. He cannot be trapped. He must be stalked and surrounded with infinite patience and care by men of long experience.

Presuming that good fortune has followed the party and some calves are captured, they are then carefully tied and loaded upright into bullock carts with high, fencelike sides. The corners are padded so that the giraffe may not injure himself on the return journey. Then the long trek home begins. The party cannot travel more than five or six hours a day without fatiguing the animals. At first the giraffe will fast. Then he will drink goats' milk with great relish. The giraffes are unloaded, untied, and allowed to exercise each night. They must be tethered, of course. But they cannot be tied to tree or stump. Instead one end of the rope is looped loosely around the animal's neck; the other is held in the hand of one of the beaters who sits all night beside his quarry. If the giraffe runs, the beater must run also. Had the animal been tied to a tree, his first leap might have broken his neck.

With similar patience the entire trip back to the base, across the ocean, and to the customer must be conducted. Any startling noise or sight will make the giraffe leap with fright and may cause his death. There was an instance in which the flash of a customs inspector's electric torch cost an agent a beautiful $5,000 animal. In another, a prospective customer drew a handkerchief from his pocket with unnecessary flourish, the giraffe leaped, bumped his head on the top of the cage, snapped his neck, dropped dead.

HOW MUCH DO LIONS COST?

To one who asks, "How much is a lion?" the only sensible reply that can be made is, "Show me the lion." However, the following prices are being quoted to circus men by animal vendors for beasts on the market this season:

Lions	$600—$1,500
Tigers	$8,000 a pair
Black panthers	$1,000
Jaguars	$1,500 a pair
Leopards	$350—$1,500
Hyenas	$175—$400
Polar bears	$600—$750
Hippopotami	$4,000
Elephants	$4,000—$4,500
Rhinoceri	$10,000—$12,000
Sea elephants	$10,000
Seals and walruses	$125 to $600

Yaks	$1,000
Zebras	$4,000 a pair
Giraffes	$4,500
Camels	$1,500—$2,000 a pair
Monkeys and apes	$10—$6,000
Kangaroos	$280
Porcupines	$30—$100
Ostriches	$100—$400
Eagles	$30—$60
Storks	$40—$175
Penguins	$225 a pair
Pythons	$40—$150
Cobras	$400—$500

WHAT BECOMES OF CIRCUS PEOPLE?

Frequently denied the security of insurance (the maximum policy for an animal trainer in a company which will insure him at all is $350), having irregular employment, it is not easy to provide for old age independence. The Circus Saints and Sinners, a lusty and genial nation-wide organization of circus fans and old troupers, is collecting an endowment at the present time looking toward the establishment of a circus folks' home probably in Richmond, Virginia.

PORTRAIT OF JOHN RINGLING—*BY MABEL DWIGHT*

CARNEGIE LIBRARY OF ATLANTA

Portrait of Mr. John

The millionaire's charm with a fine flavor of strangeness.

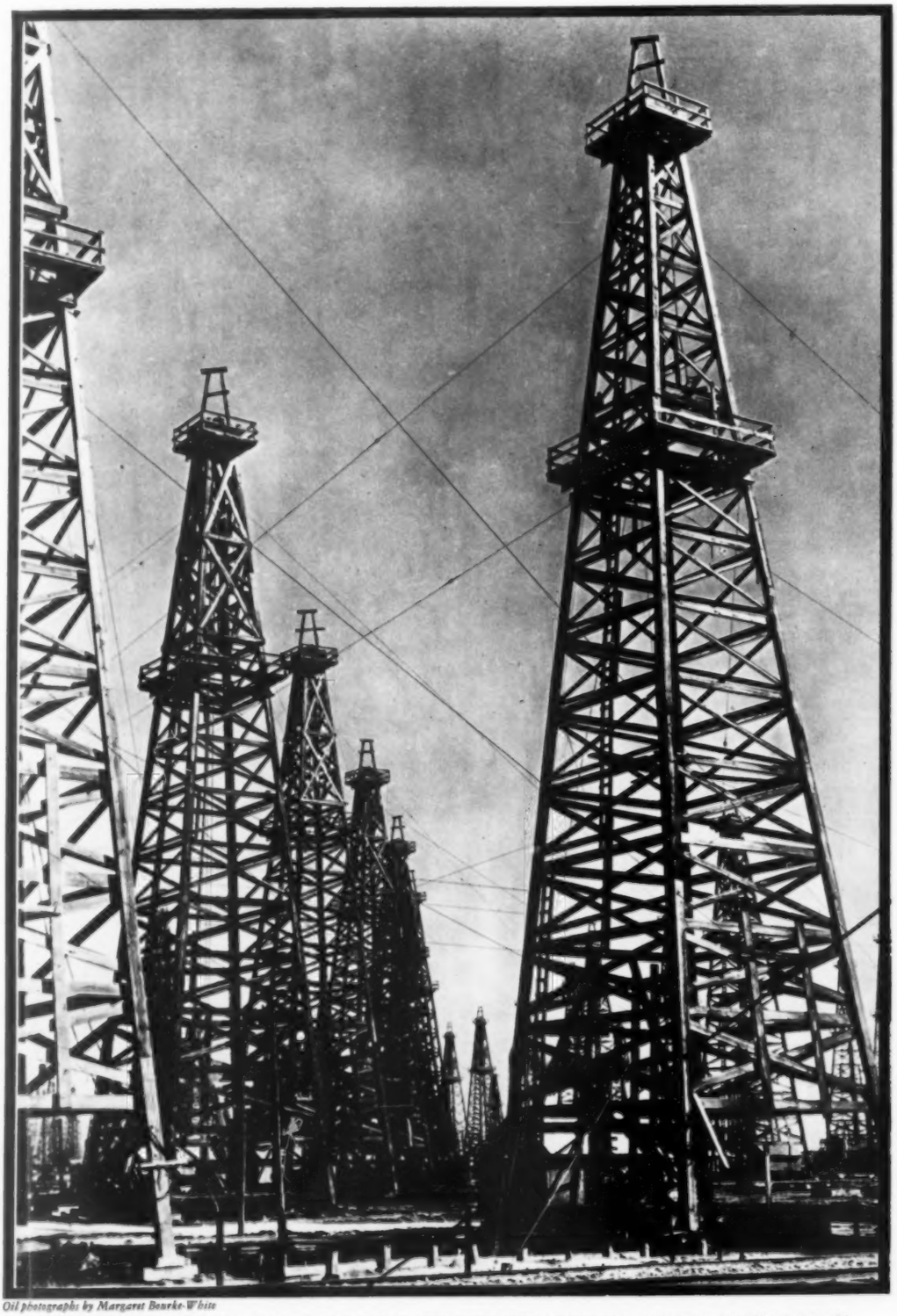
HE may be at the Ritz playing bridge until dawn or he may be taking an English lesson." That was in answer to a question as to the whereabouts of John Ringling, youngest and last of the Ringling brothers, owner in sober truth of the greatest show on earth. It was a good answer. John Ringling is like that. He resembles no one in the world. There is no short word to describe him. He is neither a circus man, nor a Middle Westerner, nor a New Yorker, nor an art-collector, nor a railroad executive, nor an oil man, nor a German-American. The only title that covers him at all is the title of millionaire. If you use the word the way French writers use it when they talk about America—as though the millionaires were the two-gun figures of a new frontier, the spectacular successors of the old Wild Westerners—then John Ringling is the best millionaire alive. He has all the elements. He is an enormous, thick, powerful man with sad, heavy eyes and an arm like a wrestler's. He talks rapidly in a low voice. He smokes a great number of cigars, removing the butt between quick puffs of smoke and throwing half the length away. He dresses superbly. He has a vast fortune, one of the biggest in America, and he spends it magnificently on a Fifth Avenue home, a Venetian palazzo in Sarasota, Florida, a steam yacht, and a private car. He has millionaire diversions. He collects art. He bought $50,000 worth of statues at the Metropolitan Museum duplicate sale, has collected more square yards of Rubens than any other private individual on earth has ever gotten together, and owns a few excellent pictures: an El Greco, Velásquez's *Maria Anna of Austria*, Rembrandt's *Evangelist* and *Descent from the Cross*, Raphael's *The Christ Child at the Well*. He houses his pictures in a private museum, 260 feet by 300 feet, built of marble especially imported from Greece, where it was quarried from ancient temples, and containing, in addition to the picture galleries, a large lecture hall with moving picture apparatus, a stage, a library, rooms for the numerous officials, a moat with living swans, and the tombs of Mr. and Mrs. Ringling.

His life and fame are perfectly in keeping with the background. He was a poor boy, one of a family of eleven, one of seven sons. His father's name was Rüngling. The family lived in McGregor, Iowa, and moved while John Ringling was small to Baraboo, Wisconsin. He and his six elder brothers started out together to tour the wild Wisconsin country as musicians. John played the bass viol. They kept at it until they discovered that people would rather watch a tumbler than hear the music of "Ringling Brothers' Moral, Elevating, Instructive & Fascinating Concert & Variety Performance." They added contortionists, a trapeze act, and a menagerie. The menagerie was a hyena. Then it was a hyena and a lion. Then it was a hyena, a lion, and a kangaroo. They played one night stands in the prairie towns, piled their tents and their belongings into wagons when the show was done, and drove all night in the mud or the clay dust of that endless country. John drove the lead team and laid the green branches across the wrong turns at the forks. Later, when their circus took to rails, John was the transportation man. He knew the length of every railroad siding in the United States and could name the monotonous, identical Indiana towns by merely wiping the steam from the black windows of the car. The circus grew. The faces of five of the Ringling brothers slanted across the tattered posters of the little towns, and the cities began to hear their name. The great Bailey, like the King of Portugal, divided the world with them in self-defense. When he died, his widow sold them Barnum & Bailey's for $410,000, and in 1909 they showed in Madison Square Garden in New York.

Later the elder brothers died, and "Mr. John" was left in absolute control, dividing the ownership with his nephew, Richard Ringling, and the widowed wife of Charles. He had purchased, in the meantime, railroad holdings, was the president of two small lines, had prospered in his oil stocks, and was worth in the neighborhood of fifty million dollars.

So far, it is the conventional millionaire's story, with a fine flavor of strangeness about the way in which the money was gained and a magnificent exaggeration about the spending of it. A millionaire's romantic charm lies in the contrast between the tooth paste by which he makes his money and the Botticelli that it buys, and there was never a more incongruous source of wealth than RINGLING BROTHERS, WORLD'S GREATEST RAILROAD SHOWS, REAL ROMAN HIPPODROME, 3 RING CIRCUS & ELEVATED STAGES, MILLIONAIRE MENAGERIE, MUSEUM & AQUARIUM & SPECTACULAR TOURNAMENT PRODUCTION OF CAESAR'S TRIUMPHAL ENTRY INTO ROME. Nor a more unlikely use of it than the purchase of Attic marble for a Florida museum of the arts. But John Ringling leaves the conventional story at that point. The rôle won't fit him. He has the size, the weight, the manner, the means, the power of the romantic figure, but the tune is all his own. Where the man of fiction would have the ox-felling arm and would have used it, laying out an entire gang of razorbacks at a stroke, Ringling never used it. There is no legend under the big tops of his battles or his rage. He is known as a cold and phlegmatic man. Where the hard-boiled, low-voiced, laconic man of fiction would have been famous in forty-eight states as a poker player, Ringling is famous for his bridge. Which he never plays for money. Where the fictional circus captain would have been feared and loved by his employees and called by some odd title, Ringling is feared, not loved, and called merely "Mr. John" to distinguish him from Mr. Otto, Mr. Gus, Mr. Henry, Mr. Charlie, Alf T., and Mr. Al. Where the man of fiction would smoke innumerable stogies, Ringling smokes innumerable denicotinized cigars. Where the book man would be notorious for his lavishness, his generosity, his women, and his parties, Ringling is noted for his domesticity. His parties are "at homes." His lavishness ends there also. And his generosity is not the attribute to which old circus men most commonly refer.

And, when all is said, Mr. Ringling is the more interesting figure of the two.



Oil photographs by Margaret Bourke-White

SPINDLETOP, WHERE CAPTAIN LUCAS STRUCK HIS GUSHER, AS IT LOOKS TODAY

Petroleum

Too much, certainly, today. Too little, perhaps, tomorrow. Overproduction against a threat of an ultimate undersupply. How Producer and Refiner look at conservation.

THERE are few questions upon which it is easier to be sensational and harder to be scientific than the question of a natural resource and its possible exhaustion. A few years ago, for example, a good many talkers and writers about petroleum belonged to what might be termed the exhaustionist school of thought. Mr. Stuart Chase, to whom so many aspects of industry appear so contrary to the common good, was particularly alarmed about petroleum's future, and lent credence to wild predictions to the effect that oil would be worth its weight in gold in ten years. It is a little difficult to determine at just what point the man who gets petroleum out of the ground ceases to be a contributor to and becomes a despoiler of the nation's wealth. And even if all the petroleum were exhausted, it might seem that the resultant disappearance of the automobile and of all machinery requiring a mineral lubricant would be rather applauded by Mr. Chase and his fellow advocates of the simpler life. Nevertheless the tempting picture of a nation's oil reserves being recklessly squandered by selfish interests was vividly painted and prominently displayed.

Today, however, the alarmist attitude on petroleum conservation is seldom taken with great solemnity. Geologists will not say that the reserves of petroleum are inexhaustible, but they will say that such reserves are incalculable. In the first place, it is not possible to say how much more petroleum may come out of deeper "sands" in such oil fields as are already in production. In the second place, it is even less possible to predict when and where and how many new oil fields may be discovered. In regard to these first two considerations it can be said definitely only that economically worked reserves are constantly approaching the exhaustion point and that petroleum must come from foreign wells more and more in the future. In the third place, the manufacture of synthetic petroleum has reached a point at which it must be respectfully considered as a commercial possibility. All of which is not to say that the supply of liquid petroleum will last forever. It is not an argument against conservation; it is not an argument for unrestricted production. It does mean, however, that to set any date, whether it be 1980 or 2000 or 3000, for the disappearance of petroleum is to reach an unsound conclusion based upon nonexistent grounds.

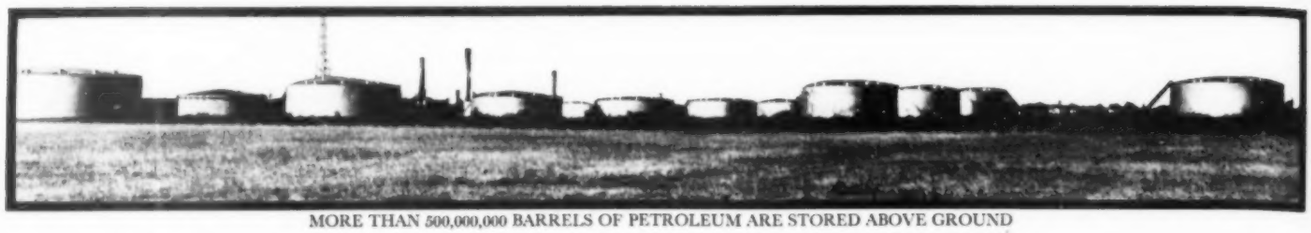
No man's opinion is any good

Oilmen who are ardent conservationists say that the danger of crude oil exhaustion is not imminent. They do insist that, as our industrial civilization is now ordered, waste of oil is a high crime. The uses of oil as fuel in processes or regions where coal could be substituted at no increase in cost is the worst kind of folly, say they. For—and this is the central point in the entire argument—there is no method of making an intelligent estimate of the amount of petroleum still beneath the earth's surface, and, concerning coal we have been told by careful geologists that there is certainly an adequate supply for 400 to 500 years. It takes only a few hundred acres to make an oil field, and one rich field will add another 100,000,000 barrels or more to the annual production. When the Seminole Field "came in," in 1927, the entire United States petroleum industry shifted from a state of underproduction to a state of overproduction. The possibility of another Seminole in 1930 is precisely as good as was the possibility of the original Seminole in 1927. No one can say how many more needles are left in the haystack; no one can predict, on any intelligent basis, how numerous or how rich may be the oil deposits that the Producer has not yet discovered. It is not so much a question of one man's opinion being as good as another's; it is more a question of no man's opinion being any good whatsoever.

And if this is the situation in the United States, where the search for oil has been most intensively conducted, it is much more the situation outside the United States, where, in many districts, men have hardly begun to draw upon the earth's resources. Here, indeed, the gaudy prediction is at least as sensible as the harrowing lament. Russia, for example, is commonly believed to contain oil deposits as extensive as those of the United States, and Russian oil production has been and remains insignificant. In Germany, long considered a negligible factor in petroleum production, a group of American oilmen has just leased 1,600,000 acres and enthusiastically predicts a Central European oil boom within the next five years. (For an account of German oil developments, see Appendix.) English, French, and American oil companies have settled the division and are now proceeding with the development of Persian oil fields. Here again the prophet is confounded by the same absence of a basis for prophecy; here again where the storehouse has not been discovered, its contents should not be guessed. Add to all these unknown elements the little known element of synthetic production through hydrogenation (see *Refining*), and it becomes sufficiently obvious that to set a specific limit upon petroleum's ultimate supply is not a very accurate or intelligent proceeding.

• • •

But, it may be argued, surely conservation has been an absorbing topic within the industry itself; surely the oilman has been talking nothing but overproduction for at least the past two years. The oilman, however, is likely to be thinking both of conservation and of overproduction not only in terms of a possible future shortage but also in terms of an undeniable present surplus. As soon as a theoretical discussion of what may happen to petroleum is succeeded by a practical consideration of what is happening to petroleum, the center of interest shifts to the 541,000,000 barrels of crude oil now stored above ground. Over this accumulated excess, a surplus amounting to a 190-day supply, the entire industry is divided into two sharply opposed factions. These factions may be defined as the Producers on the one hand and the Refiners on the other; and it is in some adjustment between their conflicting interests that the prosperity of the petroleum industry



MORE THAN 500,000,000 BARRELS OF PETROLEUM ARE STORED ABOVE GROUND

most immediately depends.

The Producer is the oil company that confines itself to getting the crude oil out of the ground. Producing companies are not necessarily small companies; their output may run up to 100,000 barrels a day, although this is a most exceptional figure. A 25,000-barrel output daily is high for a Producer, and his production may scale down as far as a fraction of a barrel daily. The essential characteristic of the Producer is not that he is small or large, but that he is interested *only* in getting oil out of the ground. He does no refining and therefore no transporting or marketing. There are in the country today upwards of 16,000 companies in the Producer class.

But there are only about 120 Refiners' companies. The Refiner is distinguished from the Producer in that his major interest lies in refining and marketing—that is, in the extraction of gasoline from crude oil, and the sale thereof. But the Refiner may be also a Producer, may also produce crude oil, and on an average does produce a great deal more crude per company than the Producer himself. He is, in other words, the big integrated company—drilling and refining and transporting and marketing and exporting—but always thinking of his business as essentially a gasoline business and usually with his refinery closest to his heart. All the Standard Oil group belong to the Refiners; so do Texas Corporation and Gulf Oil and others of the large independents. The 120 companies in the refining group produce about as much petroleum as do the 16,000 Producers' companies which live by crude alone.

But while these Refiners refine the 50 per cent of total crude production which they themselves take out of the ground, they also refine the other 50 per cent that comes from the drilling company. For of course nobody but a Refiner would have the slightest use for a barrel of crude. Therefore the only market that the Producer has for his crude is the large Refiner. Before the Producer's crude oil can drive any automobiles or lubricate any machinery, it must pass through the Refiner's hands. The Producer's product is valuable to a country with 120,000,000 inhabitants, but it is to less than one millionth of that number that he makes all his sales.

Roll of Refiners

The largest of these refining companies (and the chief purchasers of the Producer's crude) are according to Ralph Arnold and William Kemnitzer, geologists and authors of *Petroleum in the United States and its Possessions*, to be published this fall by Harper & Bros:

Standard Oil Co. (New Jersey)
Prairie Oil and Gas Co.
Standard Oil Company (Indiana)
Standard Oil Co. of California
Standard Oil Co. of New York
The Ohio Oil
South Penn Oil Company
Associated Oil
The Texas Corporation
Union Oil Co. of California
Gulf Oil Corp.
Marland Oil Co. (Continental Oil Co.) [Delaware]
Sinclair Consolidated Oil Corp.
Empire Gas & Fuel Co. (of Delaware)

These fourteen companies (in number about one-tenth of one per cent of the industry) refined, in 1929, more than 50 per cent of all the petroleum refined in the United States. Here is a concentration from which various differences of opinion are obviously bound to result.

Overproduction or oversupply

For the interests of the Producer and of the Refiner are not obviously identical. When the Refiner talks of conservation, the Producer says that he means restriction; and when the Refiner talks of overproduction, the Producer says that he means oversupply. The Producer argues that there is no such thing as overproduction in the sense that the country is producing more oil than it can use. In 1929 the domestic production was 1,005,000,000 barrels; the domestic demand was 1,009,000,000 barrels or 4,000,000 more barrels than were actually produced. Yet the surplus stock of crude (that aforementioned 541,000,000 barrels) showed during the year a 50,000,000 barrel increase. For in 1929 there were 79,000,000 barrels of crude imported from overseas and only 26,000,000 barrels exported, leaving a net importation of 53,000,000 barrels. It is, according to the Producer, this *imported* petroleum that causes the oversupply, an oversupply which the Producer regrets as keenly as the Refiner. And since there are two of the largest Refiners, Standard Oil (Indiana) and Gulf, together with one foreign company, Sir Henri Deterding's Royal Dutch-Shell combination, that do practically all the importing (mostly of cheaply produced Venezuelan oil), the Producer has a certain tendency to regard these companies with suspicion and to feel that a stoppage of Venezuelan imports would be one excellent method of reducing the amount of petroleum on hand.

Furthermore, the Producer often feels that the Refiner's suggestions for restoring an equilibrium between supply and demand, a suggestion exemplified by an all-around restriction of production, require him to make the greater sacrifice. Restriction is usually worked by means of prorating agreements in individual fields (since a nation-wide restriction might be liable to Government action under antitrust laws), agreements sanctioned by state laws in California and Oklahoma and under certain circumstances in Texas, whereby all the operators in a given field agree to hold down production to a specified percentage of capacity. But, say dissatisfied Producers, the Refiner gets the better of this arrangement, because when the Refiner cuts his production he can buy the Producer's crude and keep right on refining, whereas the Producer's crude is his little all and if he cuts his production in half he severs himself with the same stroke. "The cutting is common to all," says the Producer, "but we do most of the bleeding."

[*Continued on page 122*]

The Texas Corporation

It began on a hill in Texas. Now forty-eight states and fifty-one countries know Texas products. No man owns more than 2 per cent of its 9,800,000 shares.

THE corporate history of petroleum in this country obviously divides itself into two periods—the period before and the period after the Standard Oil Trust was dissolved by the United States Supreme Court. Perhaps that line of demarcation is not quite so sharply drawn as is commonly thought, since such non-Standard companies as Texas Company and Gulf Oil, had survived a decade of competition with the old Standard when the dissolution decision was reached in 1911, and since the tremendous expansion of the petroleum business as it developed from kerosene to gasoline would unquestionably have broken the old monopoly. At any rate, both by natural growth from below and by release of pressure from above, the industry split like one of its own molecules, and the independent oil company no longer worries through a precarious existence. Indeed, whether within or without the Standard group, there are few petroleum organizations today more thoroughly integrated, more firmly established, or more rapidly expanding than Texas Corporation, a company which, starting twenty-nine years ago in a gusher on a Texas hill now markets its products (as does no other company) in all forty-eight states of the Union and in fifty-one countries of the world.

The Texas Corporation ranks fifth in the production of petroleum and sixth in its refining, producing 4.4 per cent of the country's crude output and 6.7 per cent of the gasoline. Four of the old Standard companies (New Jersey, Indiana, California, and New York) are larger; so also, in production, is Gulf Oil. But Texas has a greater net income than Gulf; besides, the Gulf company, almost entirely owned by the Pittsburgh Mellons, is not seen through Texan eyes as truly an independent. In 1928 the Texas Corporation earned $45,073,879, about $9,000,000 more than Gulf, nearly $5,500,000 more than Standard of New York, and only about $800,000 less than Standard of California. Most striking earning statistic, however, was perhaps the rate of return on investment. Texas Corporation showed on its average net investment a return of 13.2 per cent—a rate exceeded among the larger Standard companies only by Standard of Indiana, and by far the highest rate among the independents. And, finally, from the important standpoint of expansion, Texas Corporation in 1928 invested in its business (particularly in new land and in added refinery equipment) some $62,000,000 and in 1929 floated an issue of $100,000,000 Gold Debenture Bonds. This issue—a great financing in a year of great financing—was immediately sold.

• • •

The genesis of the Texas Corporation is found in two widely separated districts—the territory around Port Arthur, Texas, and the territory around Olean, New York. It was near Port Arthur that the first great Texan oil gusher was brought in, and at Port Arthur is located today the main Texas Corporation refinery. But Texas Corporation's President Ralph Clinton Holmes and many of the men who have been associated with him came from in or around Olean, New York, site of a large Standard Oil refinery in the days when the Pennsylvania fields were the center of the petroleum industry. When petroleum shifted to the South and West, many petroleum men traveled along with it, and these northerners became known, generically, as "Oleanders," though many of them were never in Olean itself. Meanwhile it is with the Port Arthur region—busy, bustling, and never more prosperous—that the story of Texas Corporation should begin.

U. & U.

THE LATE JOHN WARNE GATES — RALPH CLINTON HOLMES
FINANCIER AND PRESIDENT OF TEXAS CORPORATION

The Port is named not for the famous naval battle in the Russo-Japanese War, but for Arthur Stillwell, once head of the Kansas City Southern Railroad, who selected the site as the southern terminus of a road from Kansas City to the Gulf. It is about fifteen miles from the coast (a lake and a canal make it a "port") and about one hundred miles northeast of Galveston. Mr. Stillwell bought the low-lying, mosquito-cursed tract with no pre-vision of petroleum. A soil-taster, munching the rich Port Arthur mud, had told him, truly enough, that the ground was ideal for rice growing, so Mr. Stillwell founded the Port Arthur Rice Farm, which in a few years showed profits of more than $2,000,000. Meanwhile, however, in nearby Beaumont, a group of oilmen had become interested in the possibilities of a hill known as Spindletop. Situated about halfway between Beaumont and Port Arthur, Spindletop was renowned for its inflammable gas springs and was a favorite resort for picnickers who took an unsophisticated pleasure in demonstrating that rivers can be set afire if there is enough natural gas in the vicinity. The Beaumont men realized that where there was so much natural gas there was likely to be some petroleum, so, in 1900, they formed the Gladys City Oil Company (Gladys was a Beaumont belle) and started drilling on Spindletop hill. In charge of drilling was one J. F. Lucas, geologist, wildcatter, and at one time a captain in the Austrian Army.

In spite of its burning waters, however, Spindletop at first showed no oil and Captain Lucas' backers, their limited capital exhausted, were about to abandon their shaft at a depth of about one thousand feet. Captain Lucas protested, was overruled, gave reluctant orders to abandon drilling. Then, at the most melodramatic of eleventh hours, Spindletop came in. The derrick man, perched high over the top of the well, was actually hauling up pipe when the earth shook, the pipe trembled, and the derrick man, sliding down a guy-rope, barely eluded an eruption of petroleum which shot pipe sections through the roof of the derrick and lifted the whole mass of wreckage high in the air in a black fountain of muddy foam. Day after day the gusher roared on while a tidal wave of

petroleum spread over the countryside. A $10,000 reward was offered to the man who could plug the oil-volcano; it was only when a deep sea diver from Galveston was called on that the mouth of the well was finally closed. The Lucas well at Spindletop was one of the greatest gushers in petroleum's history; the vision of every prospector was here realized to the full.

Spindle and Swindle

Beaumont and Port Arthur became boom towns overnight. Spindletop and the land around it blossomed with derricks, and here was one oil field where few shafts proved ever dry. But it takes much more than an oil well to make an oil company. The little mushroom organizations, even when honestly intended, lacked facilities for refining and for shipping. Around Port Arthur crude oil became a drug on the market, sold as low as three cents a barrel. Oil stock buyers found in "Swindletop" a new name for Captain Lucas' strike. Finally, Spindletop became a settled producing field, and the prospectors, including Captain Lucas, had moved on to other and newer fields. Only two important surviving companies remained. One was the J. M. Guffy Oil Company, which later became part of Gulf Oil Corporation, the other was the Texas Fuel Oil Company which became in 1902 the Texas Company, with 119 stockholders and a capital of $3,000,000. At that time the desirability of acquiring additional oil lands in the nearby Sour Lake district had become apparent. But where the Guffy Company went into the hands of a dynasty and is now and presumably forever a Mellon concern, the Texas Company went into the hands of an individual whose heirs and assigns are no longer dominant factors in the company's control.

This individual was John Warne Gates, commonly known as Bet-a-million Gates. Mr. Gates really did not go around betting millions, although he and Mr. Charles Schwab are said once to have settled a $20,000 issue by tossing a penny. Well earned, however, was the nickname, for Mr. Gates was essentially a gambler. He would bet on which of several raindrops would first reach the bottom of a window, or whether a black-and-white tiled flooring would have more black or more white squares. His American Barbed Wire Company was an important constituent of the original U. S. Steel Company, but Mr. Gates was considered a bit fast by the steel company's controlling organizers, and no steel director did Mr. Gates become. It was after he had left New York, somewhat disappointed and disgruntled, and settled in Chicago, that he heard about the young Texas company and took an interest in it. He died in Paris in 1911 (after having made more money out of Texas oil than out of all his market promotions) and left his widow and son to manage his fortune. His son, C. S. Gates, died in 1913, Mrs. Gates in 1918, and eventually the Illinois Merchants Trust Company of Chicago and Mr. Augustine L. Humes of New York became executors and administrators of the Gates estate. The Illinois Merchants Trust was John J. Mitchell's bank, which, after Mr. Mitchell's death, was absorbed by the energetic young Reynolds brothers from Des Moines and is now part of the merged Continental Illinois National Bank & Trust Company.

Today no bank and no banker control the Texas Corporation. It has more than 65,000 stockholders, no one of whom owns as much as 2 per cent of its 9,800,000 shares. Its operating executives include five of its thirteen directors and five of its eight executive committee members. The largest block of stock is held by a trustee for the company's employees who purchase shares on a deferred payment plan.

Out of Olean

Turning from the corporate to the personal side of the Texas Corporation, the story shifts back again to the New York-Pennsylvania-Ohio petroleum centers and to the already mentioned Oleanders. Joseph Stephen Cullinan, first president of Texas Company, was born in Sharon, Pennsylvania, worked for the Standard Oil Co., putting up tanks in Ohio, and went finally to Texas. While in the Corsicana, Texas, fields he became associated with T. J. Donoghue, now a Texas Corporation vice president, who had formerly worked at Bradford, Pennsylvania with the National Transit Company. Mr. Holmes himself grew up in Olean, where one of his brothers is now a bank president. Two other brothers are with Mr. Holmes in the Texas Corporation, W. K. Holmes as head of the main refinery at Port Arthur and Luther R. Holmes as vice president of the Texas Company, California. And many another Texas Corporation executive is a man whose first acquaintance with petroleum was made during its New York-Pennsylvania-Ohio period.

Possibly the early training of these men (most of whom were interested in the refining more than in the producing end of petroleum) has contributed to the tradition of efficient refining which has always marked the operations of Texas Corporation. Certainly it has been in refining that Texas Corporation has particularly excelled. It was while Mr. Holmes was in charge of the refining department that he and F. T. Manley, now a vice president, worked out the Holmes-Manley cracking process—a process so efficient that the Texas Corporation not only uses Holmes-Manley batteries in its plant today but has licensed the process, on a royalty basis, to many other companies. The average yield of gasoline is (throughout the industry) 38 per cent of crude. In 1928 the Texas Corporation averaged 43.8 per cent, and in 1929 increased this figure to 48.3 per cent, or 10 per cent better than the industry's average. Remembering that in 1929 Texas sold 30,459,598 barrels of gasoline and that the difference between 38 per cent

[*Continued on page 120*]

ON THE TEXAS CORPORATION ISLAND OFF PORT ARTHUR

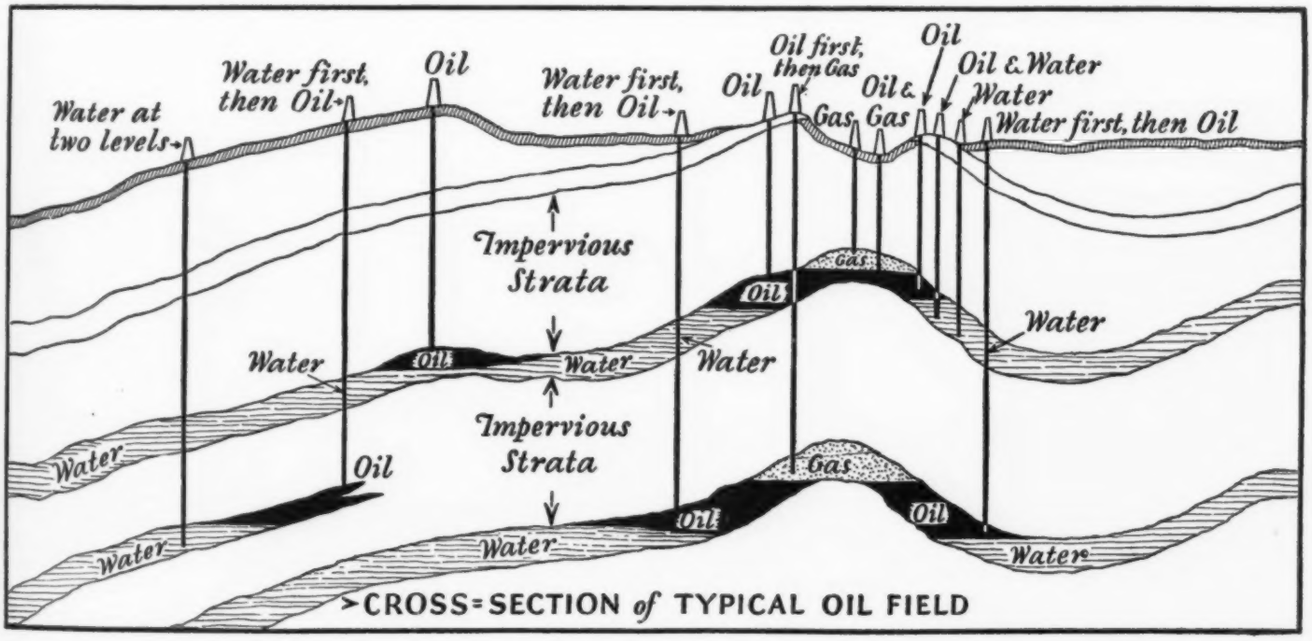
Prospecting

PETROLEUM is found in Nature's graveyards, in the cemeteries where the earth has buried its geologic dead. It was once organic matter, mostly vegetable but sometimes animal, and usually microscopic. After it had made the change from organic to inorganic existence (which is more commonly known as the change from life to death), its fragments were picked up by prehistoric rivers and washed into the prehistoric seas. Then came the recession of the oceans, a recession in which many bodies of salt water, cut off from the parent sea, were left to go through a long process of drying up—like Salt Lake and the Dead Sea today. Finally these oceans became only the beds of oceans, and the earth covered them up with layer upon layer of sand and rock. During this process, and under the tremendous pressures incident to it, the bits of vegetable and animal matter at the bottom of the dried-up ocean were squeezed together and formed either the natural gas which always accompanies an oil deposit or the liquid which constitutes petroleum. Erosion and the earth's movements have so shifted the oil-bearing formations that now oil sands may be encountered at almost any depth. In the United States oil was first struck at 69½ feet; now in the most recent California oil fields, oil sands have been struck most frequently between five thousand and eight thousand foot levels.

When, therefore, the oil prospector goes prospecting, he looks first for signs on the earth's surface of a dead ocean below. The chief surface sign is the outcropping of the rocks which formed the original bed of that vanished sea. The prospector knows that the floor of this basin, which was once under water and is now under ground, is not smooth and regular, but that at various points along its surface it has puffed up into mounds or domes and that it is in these mounds, which may be described as underground pockets, that the oil-bearing sands are found. He therefore starts his drilling at the center of a dried-up ocean and aims his drill at a point where he trusts that a hidden oil pocket may lie.

When surface indications are lacking or vague, the simplest method of getting subsurface information is obviously enough the drilling of a well. In all new fields the first well is a test well from which the prospector hopes for little more than samples of the earth. An examination of these samples describes to him the rock formations he is penetrating. But most important to the modern prospector are various detecting instruments such as the seismograph. The seismograph detects earthquakes by tracing on a strip of film the vibrations among the rock strata disturbed by the earthquakes' rumblings. The oilman manufactures his own earthquake by setting off a charge of nitroglycerine on the earth's surface, and tracing, on the seismograph, the progress of the sound waves as they go underground and are reflected from the various kinds of rock far below back to the earth's surface. The greater the density of the strata covered by the sound wave, the faster the progress of the wave. Perfection of the seismograph in the last year or two, so that it will report conditions ten thousand feet below ground, have radically altered the oil geography of the world. It should be emphasized, however, that all the seismograph, the torsion balance, or any other instrument can do is to give the prospector a description of the rock formations in which he is working. Every condition necessary for the presence of oil may be discovered, yet the oil itself may have drained off or evaporated. Sometimes the driller strikes natural gas, but finds no oil upon deeper drilling. Sometimes he finds the oil sands with no oil in them, and on further drilling discovers nothing more valuable than the salt watery remains of the old ocean. Incidentally, oil wells do not go dry—they go to water instead. In some portions of Mexico a well may "go to water" overnight and the unfortunate driller wake up some morning and find that where he was an oilman yesterday, he is a water man today. In this country, however, the oil wells decline more gradually and their dwindling output gives the driller ample warning of their shortening life.

The chances of striking a sand vary so much that it is very difficult to estimate averages. It is agreed that even in proved fields with the most modern systems of drilling, one well in three is a "dry hole." It is possible, of course, to miss oil by a few feet, and, indeed, some obsolete methods of drilling actually dammed up the oil away from the hole. During 1929 wildcatters sank from five thousand to eight thousand holes in unproved territory. And ninety-six times out of one hundred no oil was found. But the wildcatter (and there are thousands of them) searches endlessly for his El Dorado, always with the elusive vision of another Spindletop or another Seminole Field leading him on. It has been said that more money has been sunk in oil wells than has been taken out of them. On the other hand an oil well coming in at ten thousand barrels a day means a daily income of about twelve thousand dollars. So not only individual prospectors but the great oil companies (who are today the most confirmed wildcatters) continue to stick their pinholes in the earth's surface. And in justice to the wildcatter, that unregenerate individual who is so deaf to restriction of output and conservation of petroleum, it must be said that the petroleum industry today owes nearly all its spouting gushers, nearly all its richest fields to the "Dry Hole Jims" who go out into the desert or their own backyard with a little borrowed money in their pockets and a lot of gambler's optimism in their hearts and dig patiently and forlornly with a wild wish in their minds.



Drilling for Oil

And why it is wise to eat your dessert first.

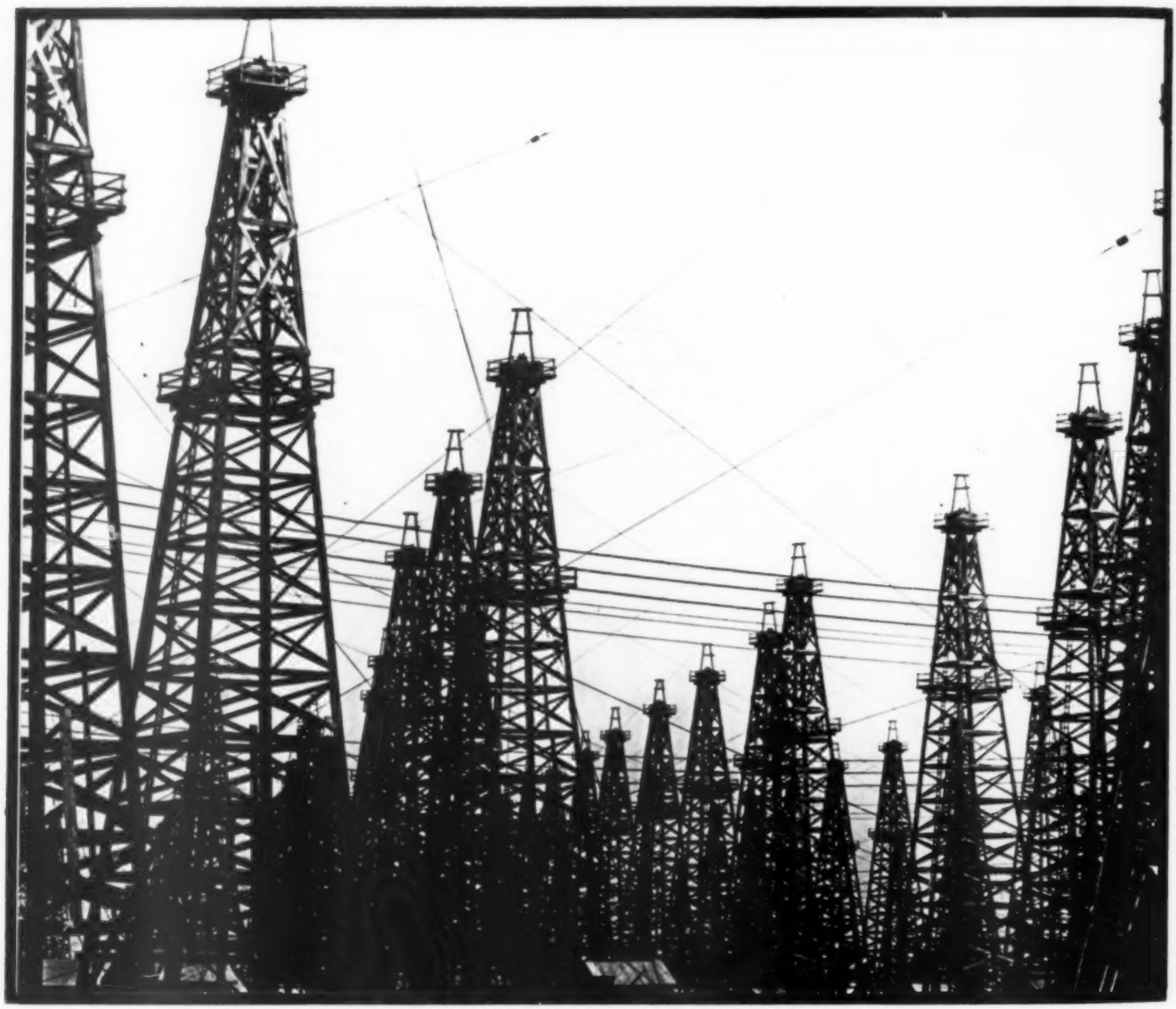
MANY of the most basic activities of civilized man involve a gouging of the earth's surface. Man scoops up the earth to make foundations for his houses. He scratches the earth to plant his crops. He dips into the earth to extract gold and silver and iron. In the earth he digs the graves of his dead. Wherever civilization has traveled, the earth's surface shows the scars of its passage.

One of the most recent punctures that man has learned to make in the earth's crust is the oil well. It is one of his deepest and narrowest penetrations, and he himself never explores its bottom.

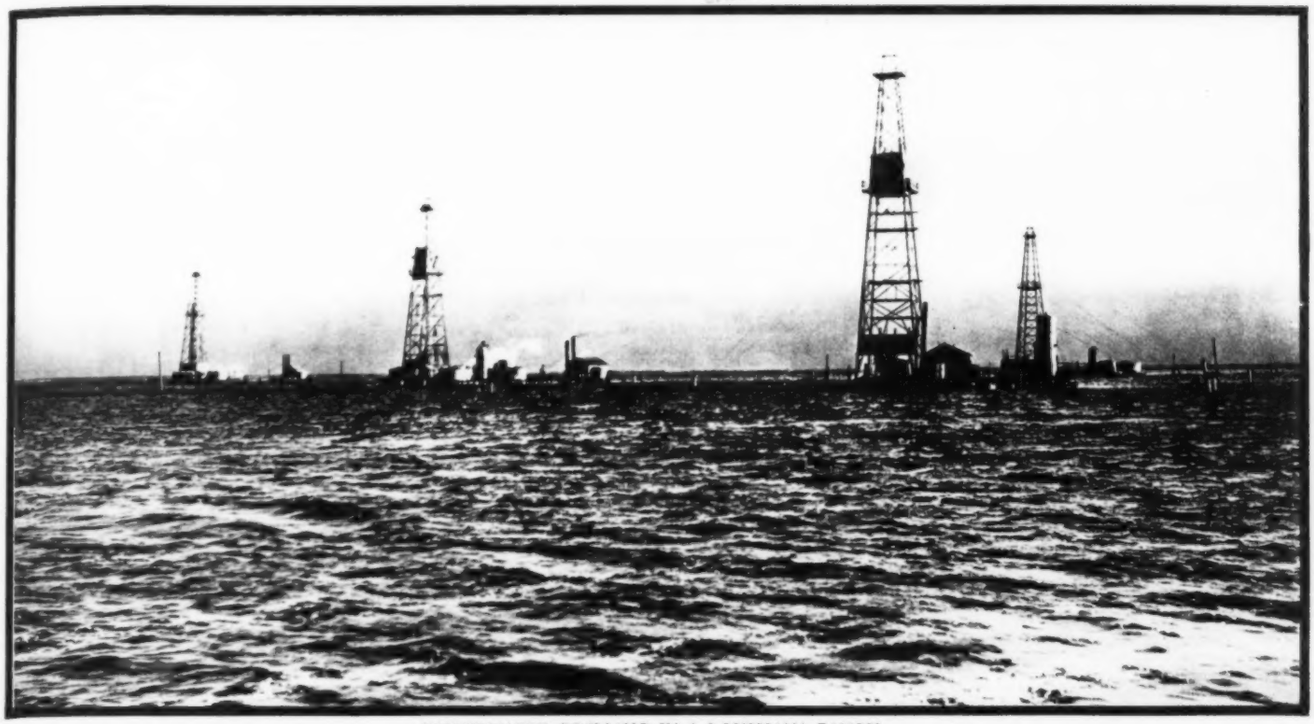
An oil well is like a giant post hole, not much more than a foot across but from a few hundred feet to over a mile and a half deep. The first well ever drilled, at Titusville, Pennsylvania, struck oil at 69½ feet; today wells of eight thousand feet deep are not uncommon.

Travelers through the muddy oil districts, noting hosts of closely clustered derricks, each with its hundred spidery feet of steel or timber, might imagine a teeming underground life. But there is no activity in the well except the drill pipe with a drill screwed on to the end, twisting and boring its way down through successive layers of rock to the thick, black, evil-smelling muck that is now latent energy and will soon be transportation or heat or light.

The drill itself is a heavy piece of carbon-hardened steel culminating in a cutting blade. One common form of drill is the fishtail, shaped as its name indicates, and particularly efficient in cutting through softer rock. The most modern drilling is performed with a rotary drill, which spins as it bores, and might be compared to a



ANOTHER VIEW OF SPINDLETOP'S CROWDED DERRICKS



UNDERWATER DRILLING IN A LOUISIANA BAYOU

propeller except that it revolves not through air or water but through sand and rock. Though the drill is made of the toughest steel, it has to be frequently resharpened or replaced. Sometimes this happens every few hours, and it may take six or eight hours to pull up the pipe.

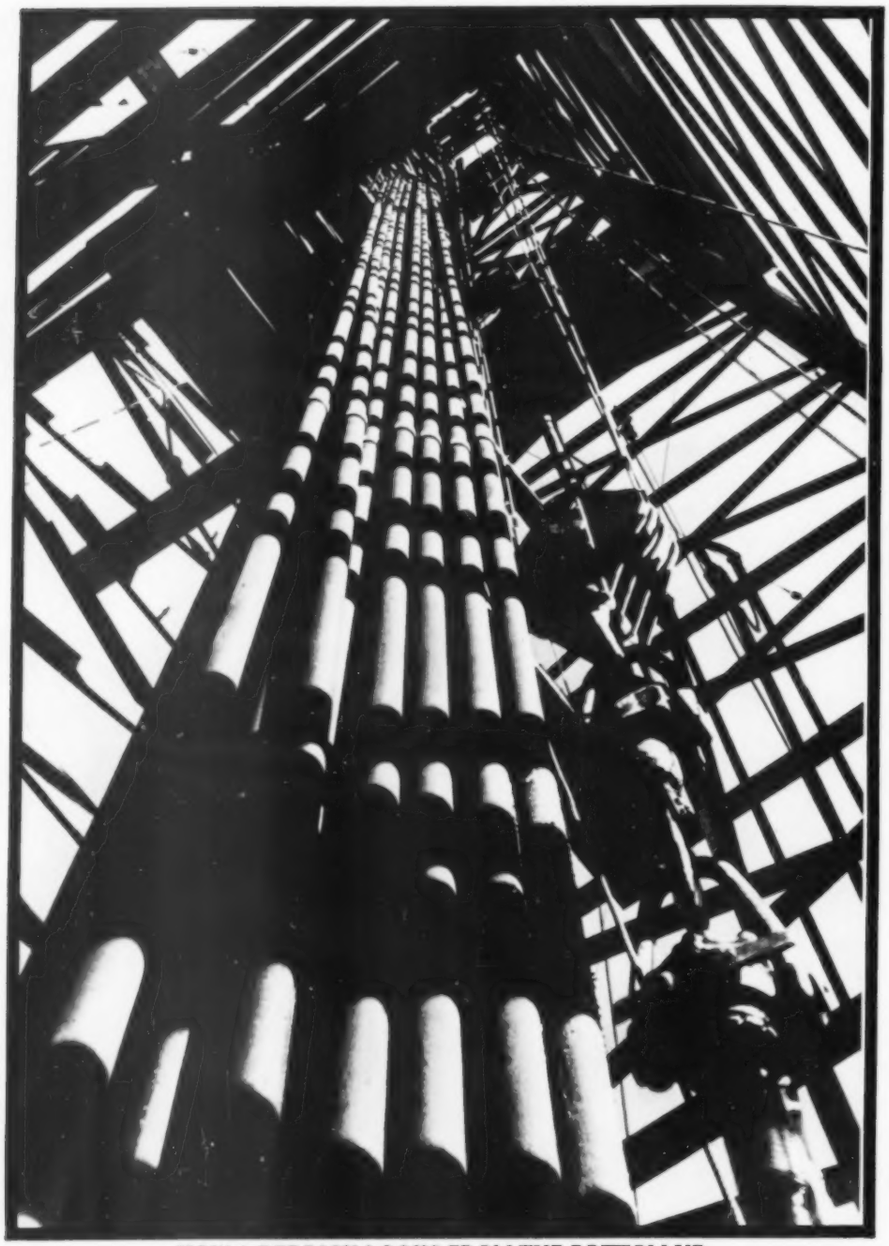
When the drilling begins, the drill is at the down end of an eighty-foot pipe length made up of four jointed smaller sections. The reason derricks are one hundred feet high is that they must be able to accommodate these eighty-foot pipe sections. Power is applied through a steel plate (the rotary) which is bolted to the derrick floor and has attachments which grasp the pipe firmly. It revolves in a horizontal plane, imparting the necessary rotary motion. From pits near the top of the hole, mud is pumped down through the hollow of the pipe. This mud, coming out at the lower end, softens the surface on which the drill is working and washes the drill cuttings to the surface. As it squeezes up (under considerable pressure) along the outside of the pipe, it strengthens the well walls and so helps prevent cave-ins. Mud is the all-pervasive element in the oil districts; muddy creatures in muddy hip boots wallow eternally in mud. So far, so simple, and if oil wells were only as deep as one section of piping, drilling them would be a matter of no great moment.

But the oil may lie six or seven or eight thousand feet below the surface, and obviously impossible would be the handling of an eight-thousand-foot stretch of pipe. When, therefore, the first eighty-foot length has nearly disappeared beneath the earth's surface, another shorter section is clamped to it. As the well becomes deeper, additional sections are added. At eight thousand feet, for instance, the drill at the end of the first pipe length is at the end of a pipe chain composed of perhaps four hundred links, each about twenty feet long. The oilman refers to this pipe chain as his "string of tools."

Whenever the drill is changed, the whole string of tools must of course be hauled up, unjointed, and again put down and reconnected. The raising and lowering is supervised by the driller, who stands by the steam engine to operate the drill. He is aided by a derrick man, strapped high up on a little platform near the derrick's top. Three "roughnecks" handle the pipes and the connections from the derrick floor. Sometimes a section of piping twists off inside the well. Sometimes a section, hauled to the surface, slips and falls to the well's bottom. In both instances the driller lowers one or another of a variety of "fishing tools," poking around in the hole until he has located the truant pipe, grips it, and hauls it in. The driller is a highly skilled angler who has developed a sense of touch and a judgment of distance that makes him seem almost endowed with the ability to look down the well and spy out the stray section of his broken pipe. When everything is going well and the drill is sharp and the thread of piping has not dropped any stitches, the drill crew loafs on the "lazy bench." But when accidents happen, and they happen so frequently and inevitably that they can hardly be called accidents, the five men are in for a job that is hard, dirty, and fast. It is a standing jest with drillers that they always eat their dessert first lest an emergency call come before they have finished eating.

It must also be remembered that an oil well may be such in name only. Even on proved oil lands, even with all possible elements of chance removed, about one oil well in three is a dry hole. Underground rock formations have a way of dipping and lensing that upsets the calculations of even the best geologists. Furthermore, no one can tell at what depth the well may come in. It is even possible to drill straight through a large oil deposit without knowing it, and sometimes small deposits are purposely ignored in the hope of reaching a richer treasure at a deeper level. When the driller thinks he may be nearing a sand, he cores out a specimen of the rock and brings the sample to the top for examination. Sometimes these cores are sent to paleontologists, who submit them to an elaborate microscopic analysis to see if their composition indicates the proximity of oil. The presence of certain characteristic fossils is the best indication. Often the driller himself looks over the samples with an eye that may be empirical and unscientific but is nevertheless extremely piercing, and makes his own decision without benefit of scientists.

When, or if, oil is finally located, it usually does not spout up in a great fountain, although spouting wells, or gushers, have long captivated popular imagination. Sometimes the oil has behind it only enough pressure (from gas or water) to bring it to the surface; sometimes it has to be pumped up. Very often the bottom of the well is dynamited ("shot" with nitroglycerine) to break up the rock formation and facilitate an easy flow. Then the bottom is lined with a perforated pipe which lets the oil through but keeps the sand out, and the top of the well is closed with a gate valve, commonly known as the 'Christmas tree," to regulate the outflow. From the "Christmas tree" the oil is piped into temporary tanks,



HOW A DERRICK LOOKS FROM THE BOTTOM UP

whence it travels to the refinery over the pipe trunk lines.

When the oil is standing in the well in a condition of equilibrium, natural gas is frequently pumped in to renew the pressure and force the oil to resume its flow. Other rejuvenating methods are now used extensively and keep many a well producing profitably, which a few years ago would have been abandoned as barren.

While the initial daily average production of all new wells is rarely more than three hundred barrels, the average yield of all producing oil wells, new and old, is about 7.6 barrels a day. A big well may come in at ten thousand or more barrels a day and mean an easy profit of as much as tens of thousands of dollars daily. Remembering that less than 3 per cent of all oil wells produce over half the oil and that no one has the slightest notion of how long even the largest well may last, the difficulties of "stabilization of the industry" become obvious. One new flush field, or even a few new gushers, will produce enough oil to create a serious disturbance in the ratio between production and consumption. On the other hand, with so many wells turning out to be nothing but dry holes and so many others producing hardly more than a trickle of oil, every producer searches continually for the rare and elusive gushers on which his prosperity depends. And finding a rich pool, he must drain it as far as possible, lest others holding nearby leases offset his wells and seize the subterranean spoils, for oil belongs, legally, only to him who brings it to the surface, not to him whose land is directly above it.

So the drilling crews go out into the fields and make their little pinholes in the earth's surface. They drill perhaps twenty feet, perhaps one hundred feet a day, and may spend from ten dollars to as high as thirty dollars for each excavated foot. A recent California well reached a depth of 9,280 feet, showed no signs of oil, is being driven still deeper in the hope that oil will yet be found. Well costs range from less than $2,000 to more than $500,000, but probably average about $25,000.

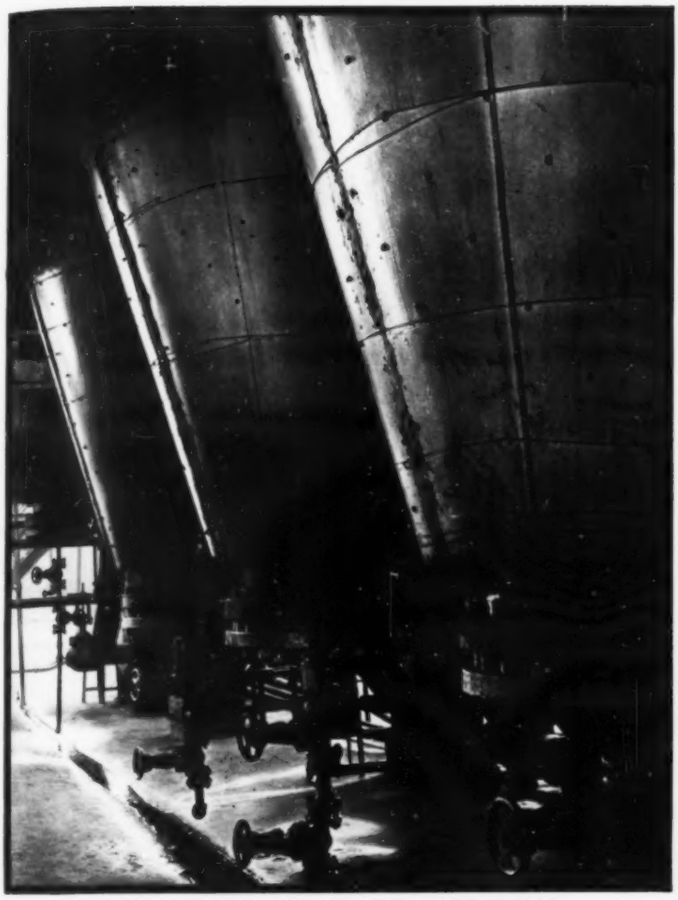
All the larger companies have wells in most of the major producing fields. The Texas Corporation, for instance, has about seven thousand wells in this country, deriving about a third of its crude production from the various Texas fields, another third from the rich California pools, and about half of the remaining third from Oklahoma. The final one-sixth is divided up chiefly between Louisiana, Arkansas, Kansas, Colorado, Wyoming, Montana, Kentucky, New Mexico. Geologists have long predicted "only five (or ten) billion barrels more oil left"—in the last few years that much and more has been produced and the end is not yet in sight.

A closely drilled field, such as Signal Hill or Long Beach in California, is a remarkable sight with hosts of derricks spaced only a few feet from each other and sprouting upward like some dense and unnatural forest. One of the worst problems of the driller is getting a straight (i.e., perpendicular) hole, many a well that is six thousand feet deep terminating three thousand feet to one side of its opening. Where derricks are jammed together, wells frequently run into each other and in Signal Hill, for instance, a driller may well be churning through his neighbor's drill mud and may well strike his neighbor's oil. But deviations from the vertical are usually unintentional, and many rich deposits have been lost by the drills following the line of least resistance and sliding along the angle of a rock formation which it was aimed to penetrate.

Some idea of drilling operations in a well-proved field can be obtained from a review of production statistics in one such area—the Long Beach field discovered just outside Los Angeles in 1921. In 1921–28 inclusive there were 1,646 wells drilled in Long Beach. All except 234 were productive and yielded 321,104,000 barrels of crude, or nearly 11 per cent of all California oil produced in that period. There were 1,200 acres of proved ground, the average yield of an acre has been 267,000 barrels, and the average cost of a well, $76,500. An oil well usually lasts about fourteen years, gives as much oil in its first year as in all the rest.

In 1859, first year of oil drilling in this country, two wells were completed. Since that time nearly 800,000 have been sunk. In 1928 there were 22,331 new wells completed, of which 56 per cent found oil, 12 per cent found gas, and 32 per cent were dry. The outstanding tendency in drilling has been toward constantly increasing depth—from an average 1,500-foot depth in 1910 to the present *deep drilling* with its many 6,000, 7,000, and 8,000 foot wells.

Refining

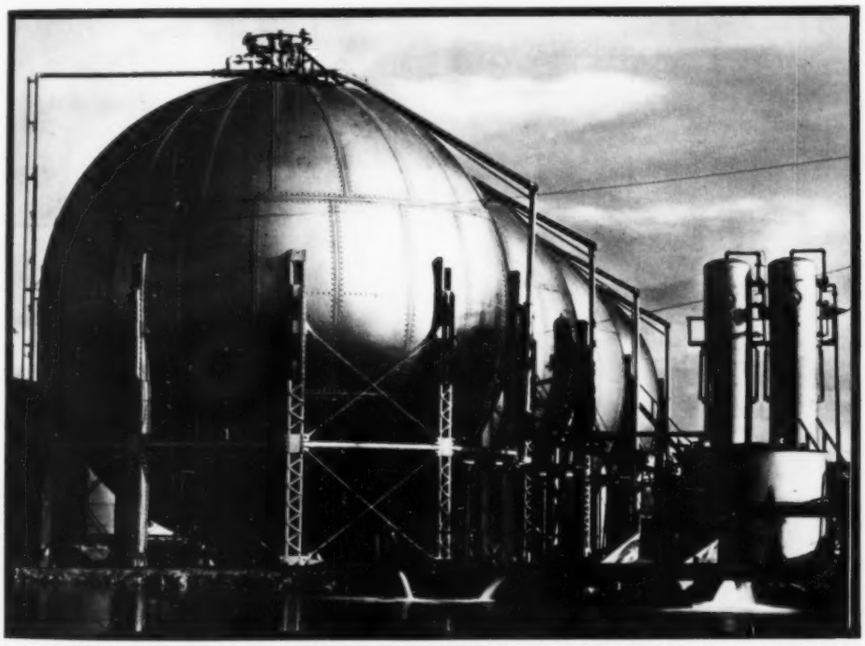


HERE BIG MOLECULES ARE MADE SMALL

THERE are in petroleum only two elements—carbon and hydrogen. But although petroleum is simple in its constituents, it is complicated in its structure. Its carbon and its hydrogen have combined with each other in so many different ways and have formed molecules of such varying number and proportion of carbon and hydrogen atoms that gas and gasoline and kerosene and fuel oil and lubricating oil all come out of the same black, sticky substance that men probe the earth to find. In the early days of petroleum, that mixture of carbon and hydrogen which made kerosene was the most important constituent, so that the process of refining petroleum was chiefly a process of extracting the kerosene molecule from its lighter and its heavier brothers. Many refiners used to dump their gasoline into rivers and harbors until the Government protested against the resulting fire hazard. Even in the early days of the automobile, the importance of gasoline was only dimly recognized, one early motor car manufacturer being offered all the gasoline he wanted at the cost of paying its transportation charges. So it was a kerosene trust that old John D. Rockefeller formed and operated, and it is interesting (although idle) to speculate what might have happened if, after gas and electricity had superseded the kerosene lamp, the automobile had not arrived to give petroleum a new and tremendously greater market.

But of course the automobile did come, the center of petroleum interest did shift from kerosene to gasoline, and it is as a fuel supply for the nation's 23,000,000 automobiles that petroleum is now a national asset. For at least the last fifteen years the refiner has concentrated almost exclusively on the problem of how many gallons of gasoline can be extracted from a forty-two gallon barrel of crude.

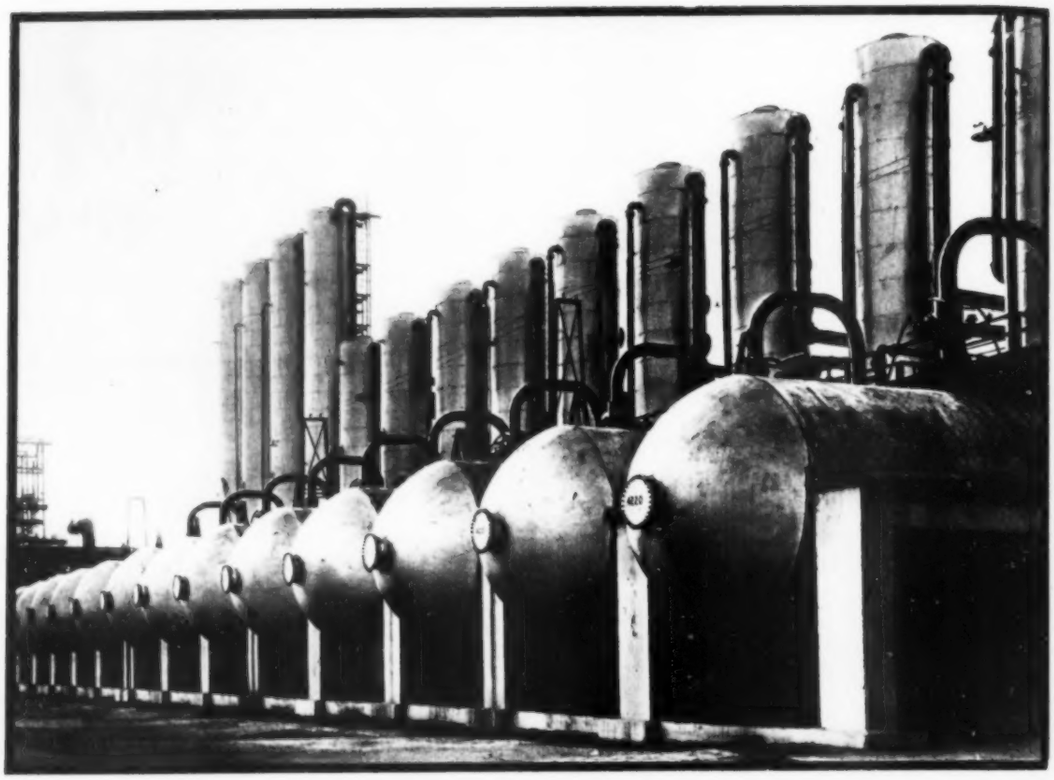
This process of extraction may be separated into two divisions—natural refining and forced refining. Natural refining is a comparatively simple process of distillation. If you put a mixture of alcohol and water in a kettle and apply heat, all the alcohol will boil off before any of the water boils off, because alcohol, more volatile than water, has a lower boiling point. The same principle applies to the various types of molecules of which petroleum is composed. When crude oil is heated, the lighter molecules—those with a higher proportion of hydrogen—are the first to vaporize. The first substance to be given off is the natural gas contained in the oil. Next comes the gasoline, then the kerosene, then gas oil, then the lubricating distillates. After the boiling-off process is completed, depending upon the degree to which it is carried out, there is left in the still fuel oil, asphalt, or coke, or, in the case of certain high grade crudes, cylinder stock is the residue.



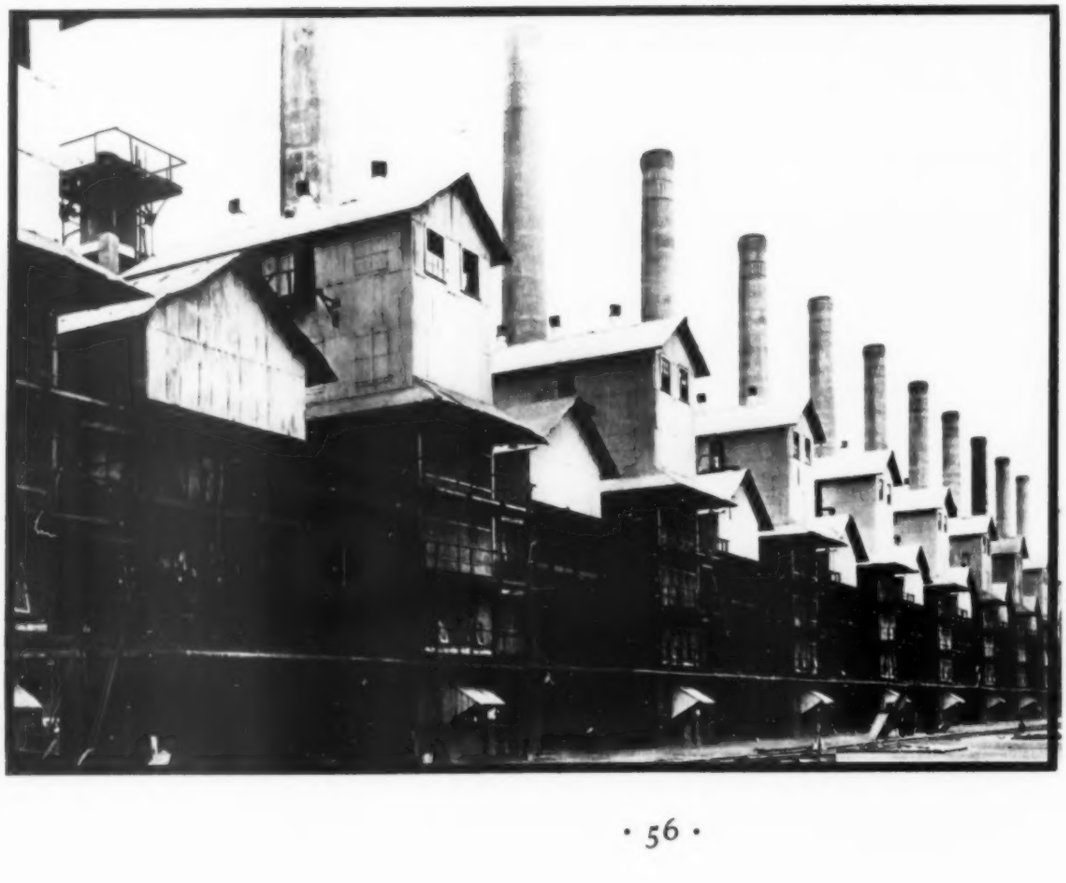
A HORTON SPHERICAL TANK FOR STORAGE OF COMPRESSING GASOLINE

As the distilled vapors are given off from the boiling oil, they are run through a system of water-cooled pipes in which they are again condensed into liquids. The liquid distillate is run through a "run-down" house. In the run-down house are what is known as "look boxes," which are simply metal inclosures equipped with windows. A "still-man," looking through the look box, can tell by the size and the color of the liquid stream, and also by frequent sampling of it, when it is time to decide that what is going through has ceased to be gasoline and has become kerosene. This line of demarcation is of course variable, and gasolines differ sharply according to their "end points." The distillation, or straight run, refining process turns about 25 per cent of the crude oil into gasoline.

But the average gasoline yield today is not 25 per cent of crude, but about 38 per cent of crude, the extra 13 per cent resulting from what is called "cracking." The cracking process is based upon the fact that the heavy molecules of



CONTINUOUS STEAM STILLS—25 PER CENT OF GASOLINE FROM CRUDE



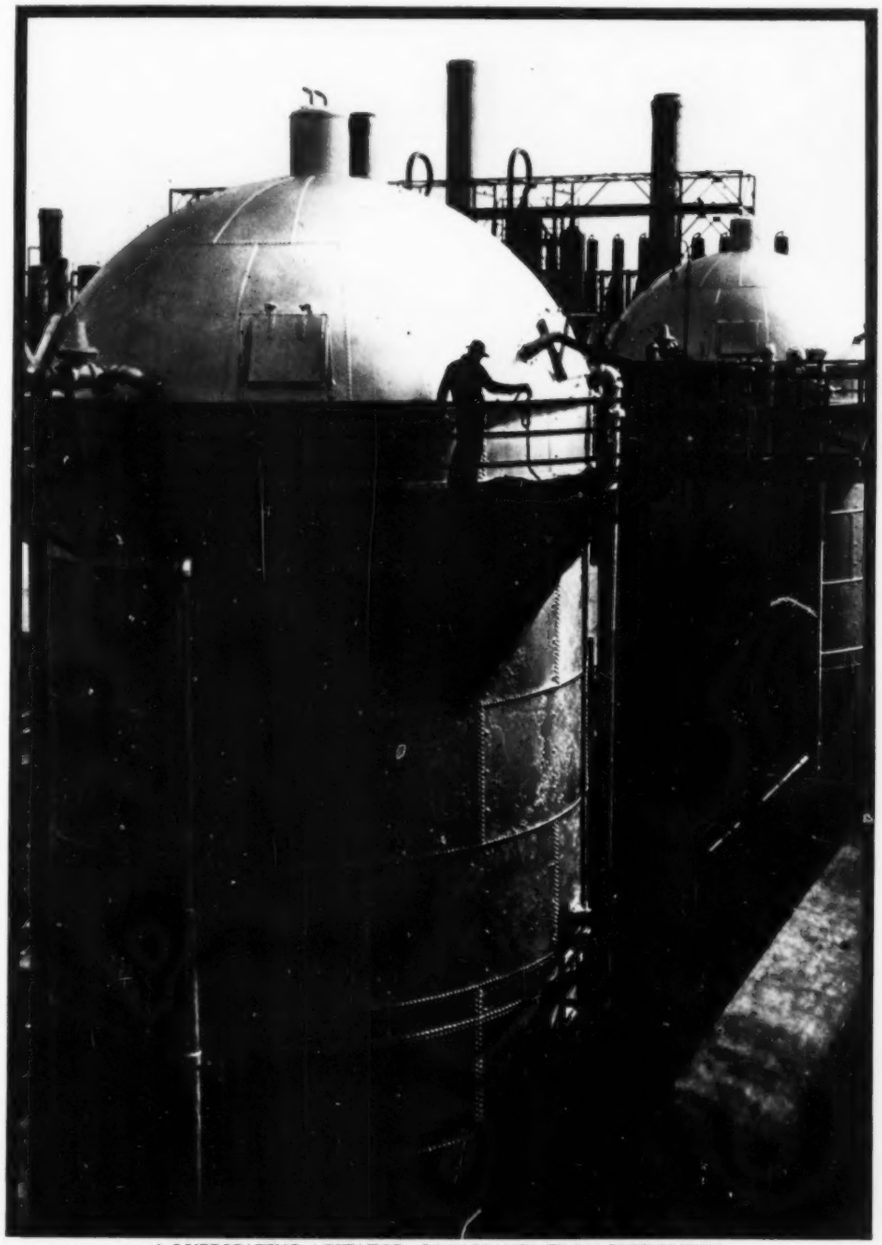
HOLMES-MANLEY CRACKING UNITS—48.3 PER CENT OF GASOLINE FROM CRUDE

petroleum—those molecules made up of a great many atoms of carbon and hydrogen, and which are also the involatile molecules which would ordinarily be turned into fuel and lubricating oils—will, when subjected to sufficient heat (about 825 to 925 degrees) and pressure, crack up into lighter molecules. The percentage of gasoline molecules that are thus split off varies with the efficiency of the various cracking processes.

The Texas Corporation has probably the most efficient cracking apparàtus in the petroleum industry, and from its barrels of crude gets between twenty-two and twenty-four gallons of gasoline, considerably better than 50 per cent. President Ralph Clinton Holmes and Vice President Frederick Thomas Manley are co-inventors of the Holmes-Manley cracking process, which the Texas Corporation has leased, on a royalty basis, to many other refiners. At the Port Arthur refineries are two long rows of Holmes-Manley batteries, each including four cracking chambers five feet in diameter and forty feet high. These chambers are built to withstand operating pressures upward of four hundred pounds to the square inch, and are fabricated by the electric welding of steel plates to form the desired shape. They look like four-story brick tenements with three rows of galvanized iron porches, and represent an investment of nearly $15,000,000. So great are the cracking pressures that pipes in the Holmes-Manley batteries have no joints, but are painstakingly bent around corners. In spite of the time and the money invested in cracking stills, no one knows better than the Texas Corporation that its Holmes-Manleys are bound to become obsolete, nor is any company more actively experimenting with new, or more ready to scrap old, machinery. It is the refiner, not the producer, who makes the money in the oil business, and Mr. Holmes and many of Texas Corporation's executives and managers in the past were oilmen from back in the days when the oil fields of Pennsylvania and Ohio were the center of the petroleum industry in the United States.

In addition to cracking, there is another form of forced refining which has added millions of barrels of gasoline to the annual output. This process is a treatment of petroleum's natural gas, which has in it a considerable proportion of gasoline, just as the atmosphere contains a considerable proportion of water. By putting the natural gas through a condensation process that precipitates the gasoline from it, refiners have added about another 10 per cent to the gasoline supply. In 1929, by a combination of the three gasoline extraction methods described above, the petroleum industry produced and sold about 18,000,000,000 gallons of gasoline, of which Texas Corporation produced and sold 6.7 per cent of the total sale. It may be added that Texas Corporation, refining 6.7 per cent of gasoline, produced only 4.4 per cent of crude, ranking sixth in refining and fifth in production. The former, to repeat, makes the money.

The possibility of cracking processes becoming obsolete has already been mentioned. Indeed, the most interesting development in the refining field today (and the development most important from the standpoint of gasoline's future) is not cracking but hydrogenation. As the name implies, hydrogenation involves the addition of hydrogen to carbon to make a synthetic hydrocarbon or, in other words, a synthetic gasoline. There are at present two main hydrogenation processes, in one of which hydrogen is added to coal and in the other to crude oil. Enthusiasts of this second process maintain that from hydrogenated crude there can be extracted an amount of gasoline equal to the amount of crude—i.e., a 100 per cent ratio. On the other hand, it must be remembered that chemical elements ordinarily do not combine with each other simply by being put side by side. It is easy, for instance, to separate table salt into its chlorine and sodium constituents, but chlorine and sodium could be stirred together endlessly with no salt resulting. Particularly interested in hydrogenation is Standard Oil of New Jersey, which controls (outside of Germany) the processes for the hydrogenation of coal developed by the I. G. Farbenindustrie, the so-called German Dye Trust. At present no hydrogenation process has reached a state of commercial importance, but many petroleum authorities believe that hydrogenation is bound to come out of the laboratory and into the refinery, where it may make the question of the ultimate reserves of petroleum a matter of purely academic interest.



A LUBRICATING AGITATOR—LUBRICANTS FROM PETROLEUM

Shipping

EMPTY hulls from most of the ports of the world, riding high on the muddy waters of the bayou, nuzzle to their berths at the piers of a squat, wind-swept island in the channel that leads from Port Arthur to the Gulf of Mexico. Along the scant mile of water front Lascar and Levantine, Briton and Dane hail each other from deck and pier. *Cymbeline* from Liverpool, settling lower in the water under a cargo of kerosene ultimately to be hawked from door to door in China from cans labeled *Yin Foo* (Good Fortune) *Hung Sing* (Red Star); *Clavarak* of New Orleans, clearing in a few days for Atlantic Coast ports; *Scottish Heather; Volunteer; Occidental;* side by side . . .

The Texas Corporation island, Manhattan-shaped, Manhattan-busy, is the terminal of a tangle of pipe lines that spout the Texas products refined on the mainland and of railway spurs that lead from the refinery enclosure. Switch engines chuff through the yards; oil drums roll heavily along the docks. From the box works comes the pungent odor of Louisiana-grown tupelo wood and the machine gun racket of box-making machines . . .

No one smokes on the island. Eight hundred people working steadily, unexcitedly, on the island, absently sniffing for the scent of smoke, live always in apprehension of fire. Old-timers recall the occasions years ago when the island *did* burn. Boat funnels must be screened. From the harbor is incessantly skimmed the surface film of inflammable oil. Hungry goats rove the island munching paper. . .

Oil in silvery tanks, row upon row. Oil in five-gallon cans clacking along conveyors. Oil spouting from pipe nozzles. Oil spurting from hose in cadence with the incessant throb-throb-throb of the pumps . . .

One of the largest oil canneries that man has yet built.

At the end of the plant pure tin from Singapore and Penang is alloyed with lead and then fed to a machine which makes 68,000 five-gallon cans each day. Automatic conveyors slide the empty cans under outlets of the Drake filler-and-capper, the invention of Superintendent Rollin Lawrence Drake. Then, filled, they go on to meet the boxes.

The boxes, two thousand of them an hour, are fashioned entirely by machine. The perfect ones, automatically cut, automatically nailed, slide down to meet the filled cans at the stage door of the filler-and-capper. The imperfect ones are rejected by the machine. Duplicates of many of these machines, developed by Texaco mechanical genii, are licensed at good profit to rival oil companies.

From the filler-and-capper, two by two in twin cases, the five-gallon containers of kerosene and other Texaco "case goods" travel hundreds of feet to the heads of spiral gravity conveyors. Their final slide is downward into ships' holds.

Large metal drums of *lubricants*, filled at the refinery and delivered to the island in gondola cars, are rolled down the piers by swart, good-natured Cajans. Each drum has two high ridges encircling it. These serve as wheels to make rolling easier. The Cajans make it easier yet. They move slowly. But steadily. These large drums are picked up in rope tackles and are lowered by derricks into gaping holds.

From these wharves the tankers and freighters go to nearly every nation of the world, excepting, of course, Russia, which is not open to United States oils. Some business is even done in India, the domain of Standard of New York, and of Royal Dutch whose Borneo and Sumatra oil fields are nearby.

On the export building a plaque is clear:

"East of Suez, or up the Amazon, in the mysterious Orient, along the Gold Coast of Africa, or in the capitals of the Old World, and again in the jungles or across the deserts, wherever the need of man calls for oil to light his dwelling or operate his machine, the Texaco trade-mark is seen and respected . . ."

OIL GOES OUT TO SEA IN TANKERS

Piping: Here Oil Meets Public Utility

Petroleum flows through 100,000 miles of pipe but Natural Gas is the greatest contemporary pipe development.

SIMPLE enough is the statement that after petroleum is taken from the well it is then sent through a pipe to the refinery. Less simple is the actual process, however, for the refinery may be 300 or 500 or 1,000 miles from the well. The Texas Corporation, for example, has some 6,700 wells scattered through Texas, Oklahoma, Louisiana, Arkansas, New Mexico, Kansas, and California. It also has 17 refineries. To bring the crude oil from the 6,700 wells to the 17 refineries, it operates more than 6,000 miles of pipe line, most of which converge at Lockport, Illinois, Los Angeles, and especially Port Arthur, site of the fourth largest refinery in the United States. Not only has every large oil company its own pipe line systems, but there are also pipe line companies interested neither in production nor refining but solely in transportation. Pipe line companies are sometimes very large and extremely profitable—Prairie Pipe Line, for instance, showing (1929) a net of $22,800,453. The industry as a whole operates approximately 100,000 miles of pipe lines as compared, for example, to the 26,000 miles of track operated by the Pennsylvania Railroad.

The analogy between pipe lines and railroads is inevitable, since both are agencies of transportation, both are common carriers (the pipe line must carry any man's oil just as the railroad must carry any man's freight), and both are built up, bit by bit, over tremendous stretches of country. A unit section of pipe line is 40 feet long and usually 8 inches in diameter, although also used are 10-inch, 12-inch, and 16-inch pipe. The sections are solidly welded together to form, in effect, one continuous section of tubing. Just as the railroader joins rail to rail until his lines of steel have crossed a continent, so the pipe line man adds pipe section to pipe section across 100 or 1,000 miles of mountain and valley and forest and stream. But the pipe line man has what the railroader can only dream of—a 100 per cent freight-carrying system with all merchandise making a through run on a main line.

As the railroad has its train dispatcher, so the oilman has his oil dispatcher. From its Houston office building the Texas Corporation controls the handling of more different grades of crude oil than any other company. The dispatcher knows the slope of each pipe line section, the flowing quality of the various types of crude, and the speed (maintained by pumps at twenty or thirty mile intervals) at which the oil is traveling. Now he sends Louisiana crude to Shreveport and West Dallas; now heavy-gravity Oklahoma crude to West Tulsa or Houston; now heavy-asphalt base crude to Port Neches; but always the great bulk of crude to Port Arthur, grand terminal of the Texas system. The dispatcher is always in communication with every mile of pipe line. He knows where pipes have corroded or frozen, where pressure has fallen from faulty pumps, where a leaking pipe is sending barrel after barrel of valuable petroleum soaking into the ground. He can almost literally put his finger on that barrel of petroleum which yesterday came out of a well in Louisiana and will arrive at Port Arthur today.

The pipe line is by far the cheapest form of overland oil transportation; but the tanker is also a factor in crude transportation. In the early days of the petroleum industry, when New York, Ohio, and particularly Pennsylvania were the major producing states, many great refineries were built along the Atlantic seaboard. Today most of these refineries (as at Portland, Bayonne, and Baltimore) receive the bulk of their oil by tanker delivery from the Gulf. Indeed, the eastern refiners have on their hands many pipe lines which, running from abandoned Pennsylvania and Ohio fields, are no longer of any value as west-to-east carriers. So Standard of New Jersey, ever resourceful, has decided to use a 371-mile line running between the seaboard and western Pennsylvania as a westward carrier and to send through it not crude oil, but gasoline. Standard believes that gasoline can be pumped through this pipe line and distributed through western Pennsylvania more cheaply than by railroad tank-cars. Here is indeed a startling innovation, since pipe lines hitherto have always carried crude but never gasoline. At present, however, it is regarded more as a means of utilizing abandoned pipe lines than as a competitor to tank-car and rail.

Possibly the most significant and certainly the most rapidly expanding aspect of piping is concerned not with liquid petroleum but with natural gas. Natural gas, like petroleum, is a hydrocarbon, most of it occurring in the form of methane. But gas and petroleum are not always found together. In Pennsylvania and in Ohio there are now in operation natural gas wells from some of which petroleum was at one time extracted while others yielded no oil at any period. But the bulk of natural gas does come out of oil wells and is produced by the producers of petroleum. The rich Kettleman Hills field in California, despite its great petroleum deposits, is regarded by many geologists as primarily a reservoir of natural gas.

In petroleum's early period, natural gas was wasted in incalculable amounts. Often it was set afire, and the mouth of the well permitted to remain a blazing torch until the gas had all burned off. Even today a well occasionally catches fire and makes one of the most difficult of all blazes to extinguish. Indeed, it is often necessary to dig into the earth around the blazing well and dynamite the flame, blowing it out on the same principle that one blows out a burning match by scattering the flaming mass and separating it from the parent fuel that feeds its fire. But the gas well fire is not blown *out* as much as it is blown *apart* into many little fires, which a crew of asbestos-clad workmen rush upon and smother with steel plates.

A great deal of the natural gas produced in the oil fields is used by the oilman himself to drive his drills and his pumps and otherwise make its energy immediately useful. Another large percentage is burned down to make carbon black, but this is rather a wasteful procedure as it requires a tremendous quantity of gas to give a small carbon black residue. Between fuel in the oil fields and reduction to carbon black, about half the natural gas produced is used in the oil fields themselves.

The other half, however, does go through pipe lines and it is this half (which may yet be very much more than half) which currently occupies the industry's attention. There are some 57,000 miles of natural gas pipe line (in addition to the 100,000 miles of petroleum pipe line), most of which are owned by the producing companies and all of which run, not to any refinery, but to the various cities where they supply heat and fuel. Temperatures ranging from 2800 degrees to 3800 degrees are obtainable with natural gas, which is widely used in all heating, melting, and forging processes and finds perhaps its greatest field in the ceramic industry (ceramic here meaning brickmaking as well as clay in its more artistic shapes). As a fuel it has purity, availability, controllability, and a very low cost per heat unit obtained.

The uses of natural gas bring it out of the petroleum industry and into the public utility field. Thus while the largest producer of natural gas is the Standard Oil Company of New Jersey, the next largest is the Columbia Gas & Electric Corp., and the third largest is Henry Doherty's Cities Service Company, which is, of course, a combination oil-and-utility organization. Possibly a half dozen years ago natural gas was considered a sick industry. Today it is thriving and prosperous. One of the chief reasons for Texas Corporation's $100,000,000 bond issue was the development of the company's natural gas resources. The improvement in the natural gas industry resulted from the petroleum industry's realization of the fact that natural gas, while certainly a by-product, is by no means a waste-product, and its consequent willingness to lay the necessary pipe line systems to carry the natural gas from the oil fields to the towns and cities.

Shipping

EMPTY hulls from most of the ports of the world, riding high on the muddy waters of the bayou, nuzzle to their berths at the piers of a squat, wind-swept island in the channel that leads from Port Arthur to the Gulf of Mexico. Along the scant mile of water front Lascar and Levantine, Briton and Dane hail each other from deck and pier. *Cymbeline* from Liverpool, settling lower in the water under a cargo of kerosene ultimately to be hawked from door to door in China from cans labeled *Yin Foo* (Good Fortune) *Hung Sing* (Red Star); *Clavarak* of New Orleans, clearing in a few days for Atlantic Coast ports; *Scottish Heather; Volunteer; Occidental;* side by side . . .

The Texas Corporation island, Manhattan-shaped, Manhattan-busy, is the terminal of a tangle of pipe lines that spout the Texas products refined on the mainland and of railway spurs that lead from the refinery enclosure. Switch engines chuff through the yards; oil drums roll heavily along the docks. From the box works comes the pungent odor of Louisiana-grown tupelo wood and the machine gun racket of box-making machines . . .

No one smokes on the island. Eight hundred people working steadily, unexcitedly, on the island, absently sniffing for the scent of smoke, live always in apprehension of fire. Old-timers recall the occasions years ago when the island *did* burn. Boat funnels must be screened. From the harbor is incessantly skimmed the surface film of inflammable oil. Hungry goats rove the island munching paper. . .

Oil in silvery tanks, row upon row. Oil in five-gallon cans clacking along conveyors. Oil spouting from pipe nozzles. Oil spurting from hose in cadence with the incessant throb-throb-throb of the pumps . . .

One of the largest oil canneries that man has yet built.

At the end of the plant pure tin from Singapore and Penang is alloyed with lead and then fed to a machine which makes 68,000 five-gallon cans each day. Automatic conveyors slide the empty cans under outlets of the Drake filler-and-capper, the invention of Superintendent Rollin Lawrence Drake. Then, filled, they go on to meet the boxes.

The boxes, two thousand of them an hour, are fashioned entirely by machine. The perfect ones, automatically cut, automatically nailed, slide down to meet the filled cans at the stage door of the filler-and-capper. The imperfect ones are rejected by the machine. Duplicates of many of these machines, developed by Texaco mechanical genii, are licensed at good profit to rival oil companies.

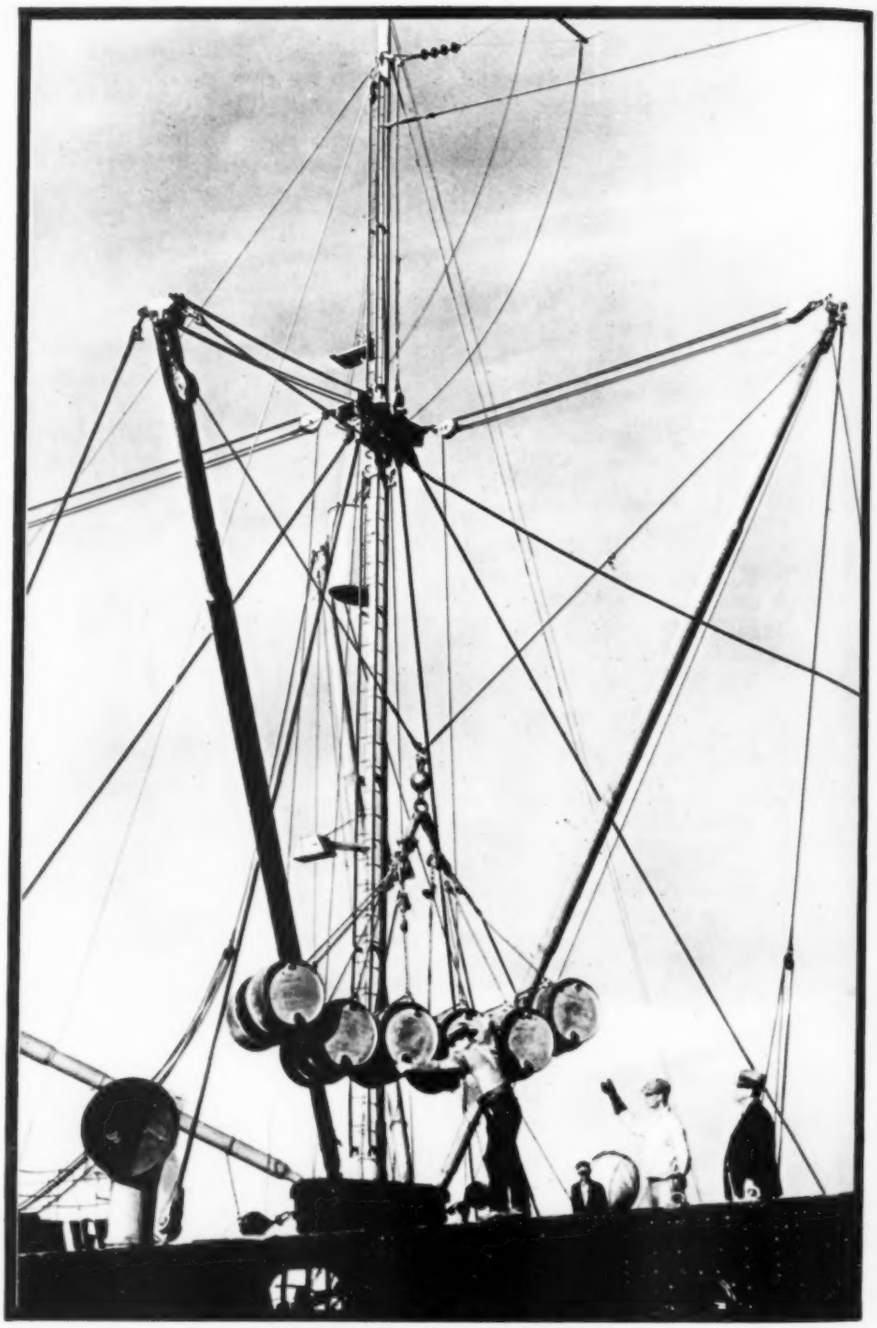
From the filler-and-capper, two by two in twin cases, the five-gallon containers of kerosene and other Texaco "case goods" travel hundreds of feet to the heads of spiral gravity conveyors. Their final slide is downward into ships' holds.

Large metal drums of *lubricants*, filled at the refinery and delivered to the island in gondola cars, are rolled down the piers by swart, good-natured Cajans. Each drum has two high ridges encircling it. These serve as wheels to make rolling easier. The Cajans make it easier yet. They move slowly. But steadily. These large drums are picked up in rope tackles and are lowered by derricks into gaping holds.

From these wharves the tankers and freighters go to nearly every nation of the world, excepting, of course, Russia, which is not open to United States oils. Some business is even done in India, the domain of Standard of New York, and of Royal Dutch whose Borneo and Sumatra oil fields are nearby.

On the export building a plaque is clear:

"East of Suez, or up the Amazon, in the mysterious Orient, along the Gold Coast of Africa, or in the capitals of the Old World, and again in the jungles or across the deserts, wherever the need of man calls for oil to light his dwelling or operate his machine, the Texaco trade-mark is seen and respected . . ."



OIL GOES OUT TO SEA IN TANKERS

Piping: Here Oil Meets Public Utility

Petroleum flows through 100,000 miles of pipe but Natural Gas is the greatest contemporary pipe development.

SIMPLE enough is the statement that after petroleum is taken from the well it is then sent through a pipe to the refinery. Less simple is the actual process, however, for the refinery may be 300 or 500 or 1,000 miles from the well. The Texas Corporation, for example, has some 6,700 wells scattered through Texas, Oklahoma, Louisiana, Arkansas, New Mexico, Kansas, and California. It also has 17 refineries. To bring the crude oil from the 6,700 wells to the 17 refineries, it operates more than 6,000 miles of pipe line, most of which converge at Lockport, Illinois, Los Angeles, and especially Port Arthur, site of the fourth largest refinery in the United States. Not only has every large oil company its own pipe line systems, but there are also pipe line companies interested neither in production nor refining but solely in transportation. Pipe line companies are sometimes very large and extremely profitable—Prairie Pipe Line, for instance, showing (1929) a net of $22,800,453. The industry as a whole operates approximately 100,000 miles of pipe lines as compared, for example, to the 26,000 miles of track operated by the Pennsylvania Railroad.

The analogy between pipe lines and railroads is inevitable, since both are agencies of transportation, both are common carriers (the pipe line must carry any man's oil just as the railroad must carry any man's freight), and both are built up, bit by bit, over tremendous stretches of country. A unit section of pipe line is 40 feet long and usually 8 inches in diameter, although also used are 10-inch, 12-inch, and 16-inch pipe. The sections are solidly welded together to form, in effect, one continuous section of tubing. Just as the railroader joins rail to rail until his lines of steel have crossed a continent, so the pipe line man adds pipe section to pipe section across 100 or 1,000 miles of mountain and valley and forest and stream. But the pipe line man has what the railroader can only dream of—a 100 per cent freight-carrying system with all merchandise making a through run on a main line.

As the railroad has its train dispatcher, so the oilman has his oil dispatcher. From its Houston office building the Texas Corporation controls the handling of more different grades of crude oil than any other company. The dispatcher knows the slope of each pipe line section, the flowing quality of the various types of crude, and the speed (maintained by pumps at twenty or thirty mile intervals) at which the oil is traveling. Now he sends Louisiana crude to Shreveport and West Dallas; now heavy-gravity Oklahoma crude to West Tulsa or Houston; now heavy-asphalt base crude to Port Neches; but always the great bulk of crude to Port Arthur, grand terminal of the Texas system. The dispatcher is always in communication with every mile of pipe line. He knows where pipes have corroded or frozen, where pressure has fallen from faulty pumps, where a leaking pipe is sending barrel after barrel of valuable petroleum soaking into the ground. He can almost literally put his finger on that barrel of petroleum which yesterday came out of a well in Louisiana and will arrive at Port Arthur today.

The pipe line is by far the cheapest form of overland oil transportation; but the tanker is also a factor in crude transportation. In the early days of the petroleum industry, when New York, Ohio, and particularly Pennsylvania were the major producing states, many great refineries were built along the Atlantic seaboard. Today most of these refineries (as at Portland, Bayonne, and Baltimore) receive the bulk of their oil by tanker delivery from the Gulf. Indeed, the eastern refiners have on their hands many pipe lines which, running from abandoned Pennsylvania and Ohio fields, are no longer of any value as west-to-east carriers. So Standard of New Jersey, ever resourceful, has decided to use a 371-mile line running between the seaboard and western Pennsylvania as a westward carrier and to send through it not crude oil, but gasoline. Standard believes that gasoline can be pumped through this pipe line and distributed through western Pennsylvania more cheaply than by railroad tank-cars. Here is indeed a startling innovation, since pipe lines hitherto have always carried crude but never gasoline. At present, however, it is regarded more as a means of utilizing abandoned pipe lines than as a competitor to tank-car and rail.

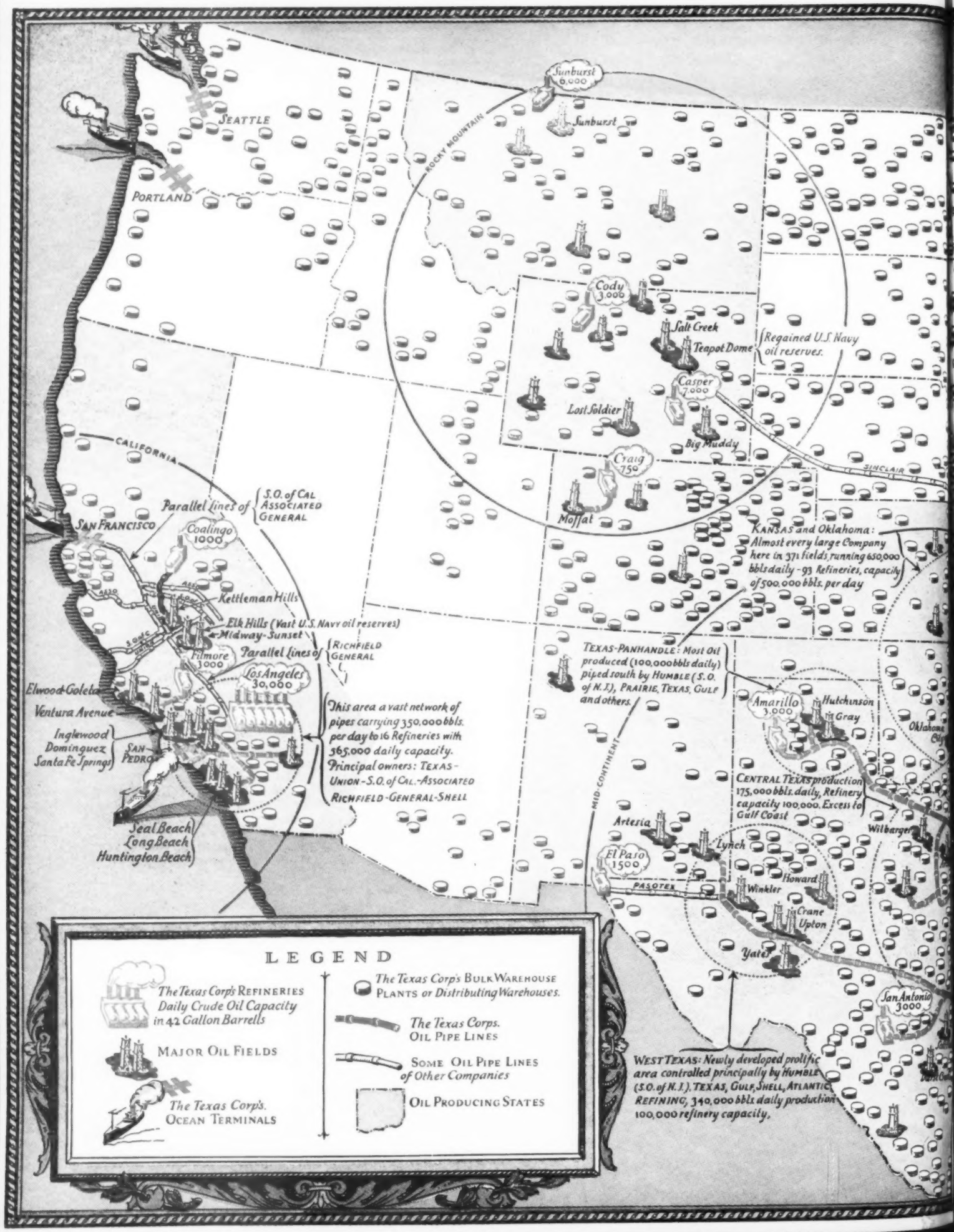
Possibly the most significant and certainly the most rapidly expanding aspect of piping is concerned not with liquid petroleum but with natural gas. Natural gas, like petroleum, is a hydrocarbon, most of it occurring in the form of methane. But gas and petroleum are not always found together. In Pennsylvania and in Ohio there are now in operation natural gas wells from some of which petroleum was at one time extracted while others yielded no oil at any period. But the bulk of natural gas does come out of oil wells and is produced by the producers of petroleum. The rich Kettleman Hills field in California, despite its great petroleum deposits, is regarded by many geologists as primarily a reservoir of natural gas.

In petroleum's early period, natural gas was wasted in incalculable amounts. Often it was set afire, and the mouth of the well permitted to remain a blazing torch until the gas had all burned off. Even today a well occasionally catches fire and makes one of the most difficult of all blazes to extinguish. Indeed, it is often necessary to dig into the earth around the blazing well and dynamite the flame, blowing it out on the same principle that one blows out a burning match by scattering the flaming mass and separating it from the parent fuel that feeds its fire. But the gas well fire is not blown *out* as much as it is blown *apart* into many little fires, which a crew of asbestos-clad workmen rush upon and smother with steel plates.

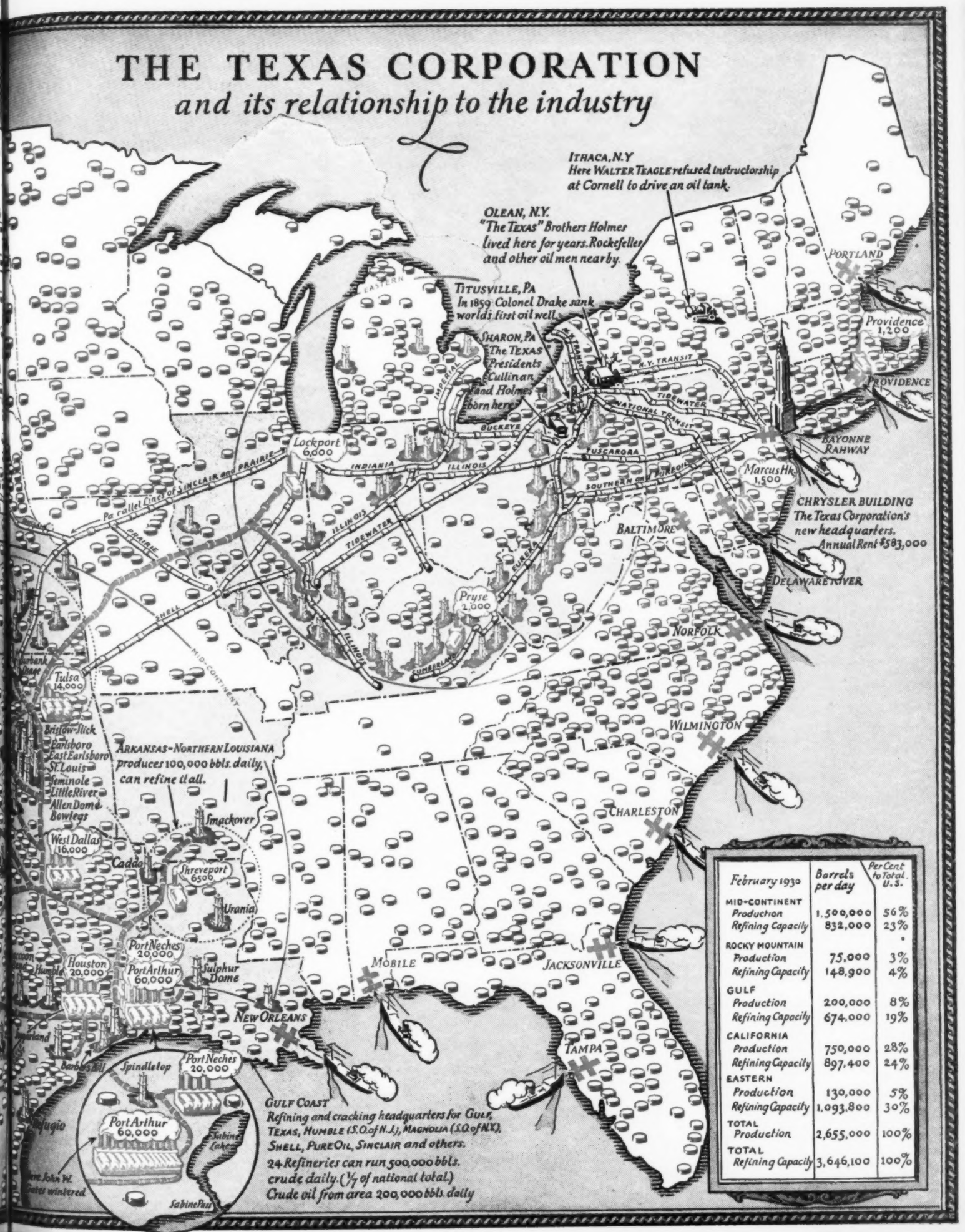
A great deal of the natural gas produced in the oil fields is used by the oilman himself to drive his drills and his pumps and otherwise make its energy immediately useful. Another large percentage is burned down to make carbon black, but this is rather a wasteful procedure as it requires a tremendous quantity of gas to give a small carbon black residue. Between fuel in the oil fields and reduction to carbon black, about half the natural gas produced is used in the oil fields themselves.

The other half, however, does go through pipe lines and it is this half (which may yet be very much more than half) which currently occupies the industry's attention. There are some 57,000 miles of natural gas pipe line (in addition to the 100,000 miles of petroleum pipe line), most of which are owned by the producing companies and all of which run, not to any refinery, but to the various cities where they supply heat and fuel. Temperatures ranging from 2800 degrees to 3800 degrees are obtainable with natural gas, which is widely used in all heating, melting, and forging processes and finds perhaps its greatest field in the ceramic industry (ceramic here meaning brickmaking as well as clay in its more artistic shapes). As a fuel it has purity, availability, controllability, and a very low cost per heat unit obtained.

The uses of natural gas bring it out of the petroleum industry and into the public utility field. Thus while the largest producer of natural gas is the Standard Oil Company of New Jersey, the next largest is the Columbia Gas & Electric Corp., and the third largest is Henry Doherty's Cities Service Company, which is, of course, a combination oil-and-utility organization. Possibly a half dozen years ago natural gas was considered a sick industry. Today it is thriving and prosperous. One of the chief reasons for Texas Corporation's $100,000,000 bond issue was the development of the company's natural gas resources. The improvement in the natural gas industry resulted from the petroleum industry's realization of the fact that natural gas, while certainly a by-product, is by no means a waste-product, and its consequent willingness to lay the necessary pipe line systems to carry the natural gas from the oil fields to the towns and cities.


Sunburst 6,000
Sunburst
ROCKY MOUNTAIN
SEATTLE
PORTLAND
Cody 3,000
Salt Creek
Teapot Dome
Regained U.S. Navy oil reserves.
Casper 7,000
Lost Soldier
Big Muddy
Craig 750
SINCLAIR
Moffat
CALIFORNIA
Parallel lines of S.O. of Cal Associated General
SAN FRANCISCO
Coalinga 1000
Kettleman Hills
Elk Hills (Vast U.S. Navy oil reserves)
Midway-Sunset
Parallel lines of Richfield General
Filmore 3000
Los Angeles 30,000
Elwood-Goleta
Ventura Avenue
Inglewood
Dominguez
Santa Fe Springs
SAN PEDRO
This area a vast network of pipes carrying 350,000 bbls. per day to 16 Refineries with 365,000 daily capacity. Principal owners: Texas-Union-S.O. of Cal.-Associated Richfield-General-Shell
Seal Beach
Long Beach
Huntington Beach
KANSAS and Oklahoma: Almost every large Company here in 371 fields, running 650,000 bbls daily - 93 Refineries, capacity of 500,000 bbls. per day
TEXAS-PANHANDLE: Most Oil produced (100,000 bbls daily) piped south by HUMBLE (S.O. of N.J.), PRAIRIE, TEXAS, GULF and others.
Amarillo 3,000
Hutchinson
Gray
Oklahoma City
MID-CONTINENT
CENTRAL TEXAS production 175,000 bbls. daily, Refinery capacity 100,000. Excess to Gulf Coast
Arteria
Wilbarger
Lynch
El Paso 1500
PASOTEX
Howard
Winkler
Crane
Upton
Yates
San Antonio 3000
WEST TEXAS: Newly developed prolific area controlled principally by HUMBLE (S.O. of N.J.), TEXAS, GULF, SHELL, ATLANTIC REFINING, 340,000 bbls daily production 100,000 refinery capacity.
LEGEND
The Texas Corp's Refineries Daily Crude Oil Capacity in 42 Gallon Barrells
Major Oil Fields
The Texas Corp's. Ocean Terminals
The Texas Corp's Bulk Warehouse Plants or Distributing Warehouses.
The Texas Corps. Oil Pipe Lines
Some Oil Pipe Lines of Other Companies
Oil Producing States

THE TEXAS CORPORATION
and its relationship to the industry



February 1930	Barrels per day	Per Cent to Total U.S.
MID-CONTINENT		
Production	1,500,000	56%
Refining Capacity	832,000	23%
ROCKY MOUNTAIN		
Production	75,000	3%
Refining Capacity	148,900	4%
GULF		
Production	200,000	8%
Refining Capacity	674,000	19%
CALIFORNIA		
Production	750,000	28%
Refining Capacity	897,400	24%
EASTERN		
Production	130,000	5%
Refining Capacity	1,093,800	30%
TOTAL		
Production	2,655,000	100%
TOTAL		
Refining Capacity	3,646,100	100%

Eating and Drinking the Imperial Dinner

Bordeaux was twice crowned—Château Lafite tested taste.

THERE was much and there is still a little wine so precious that it must be opened with a pair of red-hot tongs. Some of the last of it—a Château Lafite 1865—was offered by the Imperial Government of His Majesty King George at the State banquet which preceded the opening of the London Naval Conference. We shall presently see how various members of the American Delegation reacted to supreme temptation. By the noblest standards of good food and great wine this was the Dinner of the Year, possibly the Dinner of the Century, certainly a proper Imperial Dinner.

Sheer taste was allowed for once to vanquish politics. There was no patriotic procession of wines from the British Dominions although their representatives sat as plenipotentiaries at the board. That frothy abomination, Asti Spumante, was not poured, although its native Italy was represented by Il Duce's closest friend, Signor Dino Grandi. Even the chief Japanese delegate, Mr. Wakatsuki (pronounced, oddly enough, "Wakatsky") had to go without the sake he likes so well—so well that twenty jolly little kegs of it traveled with him from Tokyo to London across dry America.

Especially in choosing wine is patriotism the last refuge of a scoundrel. The Labor Government of Great Britain faced and bowed to the fact that in the two main classes of wine—fortified and unfortified—three nations are supreme: Spain and Portugal (represented at the Naval Conference only by their wines) and, of course, France.

Of even greater interest to the connoisseur was the preference definitely shown between the two regions which are generally conceded to produce the best French wine, that is to say the world's best: Bordeaux and Burgundy. At the Imperial Dinner no Burgundy was poured, but Bordeaux was twice crowned, first in royal purple and at last in celestial gold.

The man behind the wine

The decision to exalt Bordeaux instead of Burgundy and other decisions which caused a palpitation, not to say furor, in the sedate London wine trade were made by Mr. George Reeves-Smith. He is certainly the highest professional authority on food and wine in England,

HIS MAJESTY'S GOVERNMENT IN THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

LONDON NAVAL CONFERENCE, 1930

DINNER

MONDAY, the 20th JANUARY, 1930

SAVOY HOTEL
London

MENU

WINES

Amontillado Sherry
Chablis Mouronne, 1923

Pommery and Greno, 1921
Château Lafite, 1865 (Cachet du Château)

Château Yquem, 1921 (Cachet du Château)

Taylor's 1904 Port

John Exshaw's Brandy
Liqueurs

Caviar d'Astrakan—Huîtres Natives
Saumon Fumé—Hors d'Œuvres

La Vraie Tortue en Tasse
Bisque d'Ecrevisse

Délice de Sole Walewska

Mousse de Jambon à l'Hongroise

Suprême de Volaille Monselet
Pommes Parisienne
Cœur de Laitue Princesse

Parfait de Foie Gras à la Gelée de Clicquot

Soufflé Glacé Praliné
Mignardises

Corbeille de Fruits

Café

and the greatest French connoisseurs—the most clannish and exclusive experts in the world—rank him with themselves.

Many pleasant compliments might be exchanged in comparing Mr. Reeves-Smith and a great wine. He has age. Indeed he is almost a full generation older than the venerable Château Lafite 1865 which he chose for the delegates. But the astonishing quality of a really great wine is its power to mellow and improve with age, to continue fresh and vital long after its rivals have, in the vintner's phrase, "gone off." From his office facing the Thames Embankment, constantly assailed by the rattle of trolley cars, Mr. Reeves-Smith directs, not passively, but with an activity which is often the despair of his subordinates, three huge hotels: the Savoy (his favorite of the three), the Berkeley (where he lives), and Claridge's.

This last, an historic hostel, one of the bulwarks which British aristocracy expects to find always ready to be leaned upon, Mr. Reeves-Smith has entirely transformed in the most striking and advanced *art moderne*. He has managed to do it without losing the patronage of a scandalized and rebellious but fascinated peerage. Even before *l'art moderne* existed, Mr. Reeves-Smith had sensed this trend, which, he confidently predicts, will sweep all other styles away. A small secret may now be told. In 1913 he devised, quite unofficially and without pay, the architectural means which made it possible to quickly cover the ugly, brick façade of Buckingham Palace with its present handsome marble front—the job taking months by the Reeves-Smith method, whereas Royalty had almost become resigned to its taking years. The method, worked out in the first place when it was a question of refacing the Savoy, is simplicity itself, but no British builder had thought of using it on a large scale before. Procedure: rent several vacant lots, assemble on them everything which will be needed for the construction job, down to the very doormat, then with no possibility of delay from lack of materials, and not forgetting to pay wages high enough to preclude strikes, Your Majesty may rest assured that Buckingham Palace will have a new front in the shortest possible time.

Speed, when speed is rational and effective, is the compelling philosophy of this Englishman, who may seem to contradict his race. His first trip to America was made last spring, when he reveled with unashamed delight in the speed welter of New York.

Indeed, Mr. Reeves-Smith was intrigued by America to the extent of leaving off the correct tail coat and striped trousers in which he goes every morning to his London office, wearing instead, for the duration of his visit, a sack coat with pants to match, a costume as delightfully queer to him as fancy dress. When he got home, he decided that the sort of pneumatic drill used to dig up American streets was the very thing wherewith to destroy in a jiffy certain parts of the Savoy, the sooner to install things more modern. Though he has carefully never said so, English friends of Mr. Reeves-Smith have easily divined that he privately considers the Ritz-Carlton hotels of America appallingly old-fashioned in furnishings and methods.

Such today is the man who wrote the Menu of the Year. He spent his youth in the most English of French cities, Bordeaux, in zealous apprenticeship to the wine kings of France, the family of Calvet, premier shippers of both Bordeaux and Burgundy. (Indeed their heaviest interests are in the latter district.) Thus Mr. Reeves-Smith can scarcely be accused of bending the way his twig was inclined when he chose to exalt Bordeaux at the Imperial Dinner. As a business man whose fortune has been built on the taste buds of his tongue (he still personally samples and buys all of the 298 kinds of wine kept in stock by his hotels), his taste is catholic and without the whims of the amateur. He plumes himself on having been first of the great buyers to decide that the 1921 white wines of Germany, the hocks, would surpass all other years in the memory of man, and he bought in huge quantities and with huge profits accordingly.

Writing the Menu of the Year

So many banquet menus contain pretentious or would-be-witty names improvised for the occasion that this one is notable first for its quiet authenticity. The epicure will recognize every dish by its proper name, as the chemist knows exactly what is meant by trinitrotoluene, vulgarly called T.N.T. Similarly, Délice de Sole Walewska (see menu) has been for a generation at least the convenient abbreviation for a perfectly definite sole formula:

> Poached fillets arranged on lobster collops with slices of truffle laid upon the fillets, the whole masked with Sauce Mornay and glazed in the oven.

To write down a fish as Suprême de Sole à la Conférence Navale, when it is actually a sole in the formula Walewska is something which no honest or witty man would do. In this respect the best English tradition is probably sounder than the French. Though he may write the rest of the menu sensibly enough, your Frenchman is prone to give some impromptu and ridiculous name to the dessert, such as Bombe Stimson.

Blank-Stoller

MR. REEVES-SMITH DIRECTS THE SAVOY, THE BERKELEY, AND CLARIDGE'S

On the Menu of the Year, then, the viands are authentic prose, but the wines are poems, nay, rhapsodies. By omitting cocktails entirely, Mr. Reeves-Smith reminded the delegates as discreetly as possible of a tenet accepted as infallible dogma by the connoisseurs of two hemispheres, namely, that alcohol in a semi-raw condition blunts the keen, discriminatory edge of taste almost as fatally as does a cigarette.

In placing Spanish sherry next to the "Real Turtle," so dear to every cultivated Englishman, the menu is again on unassailable ground. For the taking of a fortified wine—one to whose natural alcohol a little spirit has been added—with soup warms and awakens the stomach with a gentle stimulation as agreeable as the "kick" of the cocktail is crude. Amontillado, besides being among the lightest, dryest, and most refined of sherries, is probably the only one known (thanks to Edgar Allan Poe and his *Cask of Amontillado*) to every member of the American Delegation.

With the Chablis the menu enters debatable ground. Those who know Mr. Reeves-Smith may surmise that he would personally have preferred to take a hock with the fish. In thus departing from British and French tradition, he would have had on his side the greatest and most venerable amateur of the vine, Professor George Saintsbury, who is frequently distressed because he cannot explain satisfactorily, even to himself, why he does not *quite* prefer Chablis with fish. At a State dinner, especially with French connoisseurs present (and André Tardieu will just barely pass for one), the serving of a German hock, however supreme, would have been a thought too bold.

The bold, yet not too bold, feature of the menu—an innovation of real note—was the offering of a choice between two such wines as Pommery and Greno 1921 and Château Lafite 1865. A Frenchman would not have dared to do this, fearing the guests would take it as a studied insult to their taste. An American, Italian, or Japanese might have done it accidentally. But the common sense traditional in Britons was required to see that it was unquestionably the thing to do.

Here were nearly five hundred guests. They must be offered the best to which their rank entitled them, but only a few could be expected to appreciate the finest. Without question the women and the Japanese without distinction of sex would choose the champagne. No one could say that the brand and vintage offered were not the best. But to a man who knows anything about wine there is no choice between any champagne and a Lafite of a good year, much less the supreme Lafite 1865, probably the greatest red wine in the world, and of which but a pitifully few bottles are left. It was in order to save as many of these as he could from being cast before such delegates as would not appreciate them that Mr. Reeves-Smith wrote into the Menu of the Year ostensibly a choice, but actually a test, of the individual

[*Continued on page 128*]

A Panel of General Motors Executives

Having ambition where the ordinary man has discontent, their only common characteristic is energy. Not bigger wheels but faster.

ONE of the major tendencies in the discussion of industry is the personification of corporations. A corporation is a bodiless creature; it loves not, neither does it hate. It is deplorably lacking in what is popularly known as human interest, and it has hardly any typical feature except that its home is nearly always in Delaware. So, because corporations, as such, are dull, their activities are frequently discussed in terms of the individuals who direct them. Thus any company with which the house of J. P. Morgan & Co. has the slightest connection is popularly (and mistakenly) labeled a Morgan company. Thus the Aluminum Company of America is widely publicized as a portion of the estate of Andrew W. Mellon. Thus the rivalry between Ford Motor and General Motors is visualized as a battle between Mr. Ford and Mr. Sloan. And thus is the ancient pathetic fallacy applied to the modern industrial world.

But where the writer about a corporation usually too much personifies the institution, the corporation itself is equally likely to go too far in institutionalizing the personalities. Corporate executives, modest and disclaiming, maintain that they are of no great importance, that their company would carry on, and will carry on, without them. But surely it will not be the *same* company that continues; surely the banner itself fluctuates with the hands that carry it. General Motors under the substantial Mr. Sloan is not the same organization as General Motors under Mr. Durant. The Cadillac of Mr. Fisher is not the Cadillac of Mr. Leland. A corporation is a bodiless entity, but it is composed of many bodies; and whenever an office boy is discharged or a file clerk is hired, the character of the whole corporate structure experiences an almost imperceptible but none the less real variation. So, whatever may be the error of discussing a corporation as if it were a person, and particularly as if that person were the president operating in a sort of vacuum, it is equally wrong to discuss a corporation as if it consisted of nothing but a gross income, a net income, and a statement to stockholders. This last conception this article completely omits.

In the following pages an attempt has been made to give a cross section of General Motors by presenting brief sketches of some of the men whom General Motors has chosen as its leaders. Obviously no directory of General Motors, with its more than two hundred thousand employees, is possible. Neither is there an attempt to segregate only the field marshals or all the field marshals in the General Motors army. The men discussed are big men in General Motors, are not necessarily its biggest men. For comparisons of magnitude are always unfortunate, and the object here has been to indicate the typical rather than the topmost; the characteristic as well as the controlling.

These pages do not discuss, for instance, the most distinguished name in General Motors: du Pont. It also happens that the head of its largest division, Chevrolet's Mr. Knudsen, is omitted from the panel. He it was who, landing in America from Copenhagen, heard a deck hand remark, "Keep moving there, you so-and-so," and has kept moving ever since. The panel does not include Buick's Mr. Strong, who, once a bandsman, still fills his house with the noise of drums, cymbals, and triangles. Nor does it include the efficient Mr. Reuter, president of Oldsmobile, but now in Germany managing the newly-acquired Opel works; or the tight-lipped, poker-faced Donaldson Brown, who succeeded Mr. Raskob in the chairmanship of the finance committee; or blue-eyed H. H. Curtice, who heads A C Spark Plugs (named for Albert Champion, French bicycle racer); or Frigidaire's Elmer G. Biechler, whose first job was digging holes for telephone posts. They do comprise, however, most of the types of men around whom General Motors is built. There is the executive; the salesman; the inventor; the operating man; the wise financial man. They constitute a section, a sample, of the men who make General Motors; look at them through a magnifying glass and General Motors will be presented to your view.

They are men of various kinds. Not all belong to "Mr. Raskob's Eighty Millionaires" (the group of major executives participating in General Motors stock-sharing trust) but most of them are millionaires and many run to million dollar mansions and half-million dollar yachts. The yacht, incidentally, appears to have become the current symbol of riches, with an island to go with it as the occasional crowning touch. Some are college men and some are self-made; some wear spats and some prefer shirt sleeves—they have hardly a common characteristic except energy.

Someone has remarked that the gods of the ancients were "men writ large." The deities of modern industry are men geared high. They do not necessarily possess outstanding qualities of abstract mentality. But they have an ambition where the ordinary man has a discontent; they dominate their big jobs where the ordinary man is dominated by a small job; they have confidence that they are moving up where the ordinary man has an apprehension that he may be moving out. It is not so much that they are bigger wheels as it is that they rotate so much more rapidly. No matter how much money they may make or how powerful they may become, most of them retain a fundamental simplicity. The Fisher brothers, for instance, are not most characteristic when their yachts are scattering the spray or their old masters are adorning their galleries. They are most characteristic when each of them, on his particular night of the week, is paying a visit to his aged mother. And so it is with most of the tycoons, particularly of the self-made sort. They are so rich that they do not know what to do with their money. They are so powerful that the livelihood of thousands of workmen may depend upon them. But they lack imperial instincts and are, happily, without delusions of grandeur. Thus they are never so pleased as when described as just poor boys who have "got along." Which is like explaining the lion in terms of the cat.

CARNEGIE LIBRARY OF ATLANTA

U. & U.

ALFRED PRITCHARD SLOAN JR. is president of General Motors, which has made more money in one year than any other concern in history and, profit-wise, has left such giants as U. S. Steel and Pennsylvania Railroad far behind. He has a long, thin, tired face and a long, thin, nervous body. Mr. Sloan lacks entirely the arrogance of office. His is the late-maturing personality, developing more through its responsibilities than through its ego. A subordinate who had made a rather radical suggestion concerning his department said, "I suppose you will bawl me out for this." With an astonished expression Mr. Sloan replied with great sincerity, "Have you ever known me to bawl anybody out?"

Unquestioned is Mr. Sloan's leadership of General Motors, but the company is not a one-man show. General Motors is not greased to the Napoleonic individualism of Fox Film or Ford Motor. It is indeed organized specifically against the man-on-horseback idea, and the various divisions are filled with high-powered executives who would not take kindly to being ridden. In General Motors there is a tendency (perhaps more theory than fact) to operate by "suggestions" rather than orders. The danger of such an organization is a lack of unified progress. The guard against this danger is Mr. Sloan, adjuster of difficulties, reconciler of temperaments, sponsor of progress. To General Motors his is the admirable contribution of stifling the tempests while they are still in the teapots.

Some there are who detect in Mr. Sloan, despite his tremendously successful career, a certain frustration. He did write a portion of a book on business—a book which (surely not for lack of a public) has never appeared. Despite an occasional checked suit and flopping handkerchief, he is by no means the "playboy executive." He does not golf. He seldom uses his yacht. He collects neither pictures nor philanthropies. He works hard all day and every day (although not, as Mr. Durant was said to do, day and night also). Yet he has not turned into a man with a narrow, limited, one-track mind. This may have some relation to the fact that ever since his Hyatt Roller days he has been in a mechanical business and has *never* liked to tinker. He is forever patient, and his courtesy to an office boy is the same as his courtesy to his friend of old standing, Henry Ford. Mr. Sloan has neither escaped from his job nor succumbed to it. He is merely working at it.

And, as his other executives will tell you, he "gets a great kick out of it." He has an infinite capacity for removing trouble; a tireless zeal to inspire zeal. Exercising an authority without a coercion, placing a cool, calm hand on many a fevered brow, Mr. Sloan has kept the most profitable industrial organization in the world functioning with smooth efficiency. To Mr. Pierre du Pont the credit for putting General Motors upon an even keel, to Mr. Sloan credit for greatly accelerated progress with the ship still balanced and secure. Certainly Mr. Sloan's has been an accomplishment which would be eminently satisfactory to almost any man other than, perhaps, himself.

RICHARD H. GRANT is General Motors salesman extraordinary. Once he sold National Cash Registers under the guidance of John H. Patterson, one of the master salesmen of all time. He sold National Cash Registers in St. Louis, Philadelphia, and Atlanta, then, working from the central office in Dayton, introduced the elaborate cash register system now used in department stores throughout the country. In 1913, he was National Cash Register's general sales manager. Charles Franklin Kettering, the Edison of General Motors, was also at one time a National Cash Register employee. Mr. Grant then sold Delco-Light farm installations, then Frigidaires, then Chevrolets. Now he is in charge of General Motors sales, service, and advertising.

The essential of the good salesman is a devotion to selling, a single-minded concentration on the making of many sales. Such words as "high pressure," "contact," and especially "service" are no more trite to the salesman than prayers are to a clergyman. They are a part of his religion. And they are a part of Mr. Grant's religion. Mr. Grant can harangue a group of salesmen with the oratorical fervor, the verbal imagery, and the high seriousness of a William Jennings Bryan. In addition to addressing sales meetings, he used to make phonograph records of sales talks for all salesmen to play and heed. But instead of talking about a double standard of coinage or the literal interpretation of the Bible, Mr. Grant can talk about a mechanical refrigerator or an automotive achievement. From a logical standpoint, the Chevrolet is probably a good deal more intelligent Cause than bimetallism, but it takes a salesman to throb to it.

And Mr. Grant is the complete salesman. Large, serious eyes back of large, serious spectacles, a small but wiry body with a tremendous and unflagging energy, an unswerving conviction of the superiority of General Motors' products—plot the ideal salesman and Mr. Grant will be the resultant graph. At college (Harvard) he was disappointed in not quite making the football team. After college, the poetical portion of his nature found expression in some eighteen months' apprenticeship in a bookstore. Then, after a brief intermediate period with the New England Telephone Company, came Dayton and cash registers and the powerful Mr. Patterson to shape Mr. Grant in the way he was to go.

Mr. Grant has not much more private life than, for instance, a bishop. He did take an active part in War work in Dayton, and he does look after a 274-acre farm near Dayton, a farm on which he raises pure-bred live stock. But he spends most of his time in sales and visions of sales. He once told a pipe-smoking subordinate that the pipe, too frequently indulged in, would cost General Motors five thousand dollars yearly in lost sales energy. Last fall, after the market crash and the general feeling that auto sales for 1930 would be considerably under auto sales for 1929, Mr. Grant had to discharge some of his men. Said one dispensed-with individual, after the dispensation: "Mr. Grant made me feel sorrier for him than I felt for myself."

Mr. Grant's recent promotion from head of Chevrolet sales to head of General Motors sales is an added instance of General Motors coördination. There is wisdom in the plan: the star salesman now works not for any division of General Motors, but for General Motors itself.

JAMES LYNAH, of General Motors general purchasing committee, is a great purchasing agent who does not do any purchasing. The committee system under which General Motors functions is so theological in nicety of distinctions that even men who have been with the company for many years have difficulty in defining it. Essentially it represents an attempt to keep General Motors' seventy-odd divisions functioning freely as individual units but efficiently as parts of the entire institution.

The purchasing committee, for example, is made up of purchasing agents from the various divisions plus an executive secretary, Mr. Lynah, representing headquarters. The committee confers on the standardization and correlation of purchases, on waste, duplication, etc., etc. But, conference ended, the divisional members go back to their divisions and do their individual buying for themselves. Some years ago, General Motors tried working with a group of headquarters experts advising and directing divisional effort. Thereupon the more potent divisions decided that no outsider could tell them what to do. So the committee system came into existence.

Mr. Lynah himself is a gentleman with a stern look and a Southern accent, the look dominating his office hours and the accent getting the upper hand in his leisure moments. Living in hospitable bachelor quarters, he is genuinely popular. He has always been extremely fond of the theatre and indirectly has contributed one of its stars. For, as captain of Cornell's 1904 football team, he sent into action Player Louis Wolheim, and out of a lively scrimmage emerged Mr. Wolheim with the battle-scarred countenance later so famous in *What Price Glory* and in the *Hairy Ape*.

GORDON LEFEBVRE is hard. At forty, he is vice president in charge of operations at Oakland-Pontiac. At thirty-five, he was general manager of General Motors of Canada. He works with his sleeves rolled up and a bashed hat on the side of his head. He smokes, swears, spits, chews, and the men like him. He hates golf. He hates novels. He wants to be out in the factory seeing why the wheels do not go round more rapidly.

Mr. Lefebvre has often been a student but never a graduate. After having been in and out of several private schools, he went to West Point. There he and some other high-spirited classmates were involved in a hazing investigation and expelled. Afterwards a special act of Congress reinstated them, but Mr. Lefebvre did not return. He shifted to V. P. I., where again he received no diploma.

Three days after his arrival at Oakland-Pontiac, he ordered that all precision measurements be made twice as precise. Then he got the men better tools with which to work. He discovered that supplies were lying around for four weeks. Four days, said Mr. Lefebvre. He started a war on waste, with prizes and display boards and speeches and sectors. The top prize was one hundred and fifty dollars, and one of the waste-removing suggestions was worth thirty-three thousand dollars.

Besides being hard, Mr. Lefebvre is handsome. Tall, dark, and handsome. He likes to get into evening clothes (all military men are fond of uniforms) and dance. He has a semi-pompadour and sparkling eyes and a mouth like a saber slash and looks at least a dozen years younger than his age. He is married, has two children, lives in Birmingham, smart Detroit suburb. A Southerner, he imports his ham from the South. Watch him on the dance floor, and you would guess that he came from Richmond and from West Point. You feel that a war would be his best background, but he makes a factory do almost as well. He is a congenital Major of Infantry who has become a Captain of Industry.

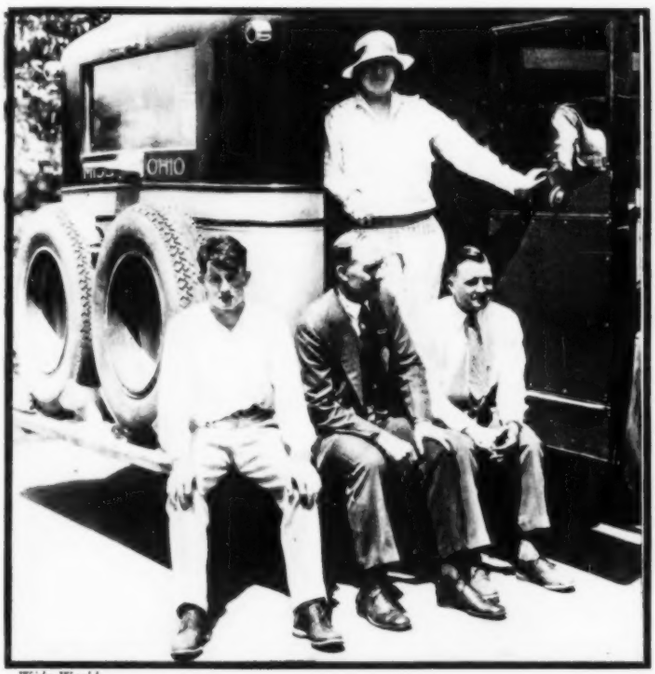
LYNN McNAUGHTON, Cadillac's vice president in charge of sales, who has been a Cadillac man since 1905, came to the Cadillac organization in pretty much the *mere boy* period of development. Unobtrusive in dress and in manner, Mr. McNaughton reduces to no particular formula except, perhaps, the unoriginal but inescapable maxims concerning persistence and industry and ability. He is, however, the father of automobile service, in the technical, not the oratorical, sense. One of his earliest Cadillac jobs was the management of the parts division, and so well did he handle it and so continuing has been his influence that last year, when a 1902 model Cadillac was sent wheezing from Detroit to New York, Cadillac service stations along the route were readily able to supply it with all necessary spare parts. Mr. McNaughton was one of the first salesmen of the self-starter, the Cadillac being the pioneer self-starting automobile. Still advanced, the Cadillac featured the 1930 auto shows with a sixteen-cylinder car. He was also one of the earliest sponsors of color-in-the-automobile, the Cadillac at one time being offered in no less than five hundred color-and-upholstery combinations. Mr. McNaughton's son, John, goes to the Detroit University School; Mr. McNaughton goes to the Detroit Athletic Club; and the McNaughton family is at present awaiting the completion of a McNaughton residence in Grosse Pointe, smart Detroit suburb.

Mr. McNaughton is at the beginning of his second quarter century as Cadillac employee. He saw its prosperity under the Lelands, and their departure. He watched Mr. Durant's formation of General Motors, and heard Mr. Durant's farewells. Now, under the General Motors administration of Mr. Sloan, under the Cadillac administration of Mr. Lawrence Fisher, Mr. McNaughton carries cheerfully on.

Blank-Stoller Inc.

CARNEGIE LIBRARY OF ATLANTA

AN INVENTOR is a person whom the public regards as a lunatic and the scientist regards as a mechanic. Sometimes he is so successful and his inventions are so far-reaching that he becomes, like Edison, a wizard in his lifetime or, like Fulton, a legend after his death. Sometimes his invention, like the Westinghouse air brake, is vital but not intimate, and the inventor reaps rather a vague and impersonal splendor. And sometimes, when the inventor is working for a large corporation, his public is virtually unaware of his existence, although in this case he may well be compensated in royalties for what he loses in glory. Thus it is doubtful whether more than one motorist out of a thousand has ever heard of Charles Franklin Kettering, or knows that it is through his ingenuity that motor cars need no longer be cranked and that bedroom windows can be opened and shut from the bed.



Wide World

Except for the accident of wealth, Mr. Kettering fits so closely the conventional conception of an inventor that the resemblance becomes almost unconvincing. He was, of course, a poor boy. He was born on a farm near Loudonville, Ohio. His inventive genius and studious nature early manifested itself in the creation of a book rest attached to a plow handle, so that the boy Kettering could at once plow a field and read a book. He has had the uncommon man's usual difficulties with the conventional man of business. When he was an engineer for the National Cash Register Company, old Mr. Patterson used to fire him on sight, but the engineering department always hired him right back. During the War when he worked at Dayton on airplane engines and traveled frequently to Washington, he was continually boarding a train without either money or tickets. One of his maxims is that the average man hates changes and that the business man hates them more than anyone else. Though most of his inventions have been sufficiently concrete and certainly practical, he also entertains large, broad visions, such as reclaiming the tropics by building in them refrigerated houses.

Mr. Kettering's first great invention was the self-starter, in which the Lelands (who controlled Cadillac) were particularly interested inasmuch as one of their friends had been killed in a cranking accident. Mr. Kettering took the Lelands all over Detroit on a stopping-and-starting demonstration trip. The starter worked perfectly and the Lelands left convinced, but as soon as they had departed and Mr. Kettering attempted to start his car home, it refused to work. Shortly after this incident, Mr. Kettering ran a self-starting car into a ditch and broke a leg, and the only other car equipped with a self-starter caught fire and burned to the ground. Thereupon Mr. Kettering went to the Cadillac plant and, with his broken leg in a plaster cast, built another self-starter into another model car. The success of the Cadillac self-starter resulted in the universal adoption of the anti-cranking device and also in the prosperity of Mr. Kettering's Dayton Engineering Laboratories Company, products of which have since become famous under the trade name of Delco.

The part that Mr. Kettering played in the development of Duco is difficult to determine, inasmuch as Duco is officially the product of the du Pont laboratories. Mr. Kettering at least suggested the desirability of a quick-drying finish by his vigorous protest against the thirty-seven days customarily required for the drying of auto paint. When paint men said they might perhaps get the time down to thirty-four days, Mr. Kettering mentioned one hour as the ideal interval. The rest is lost in corporate obscurity.

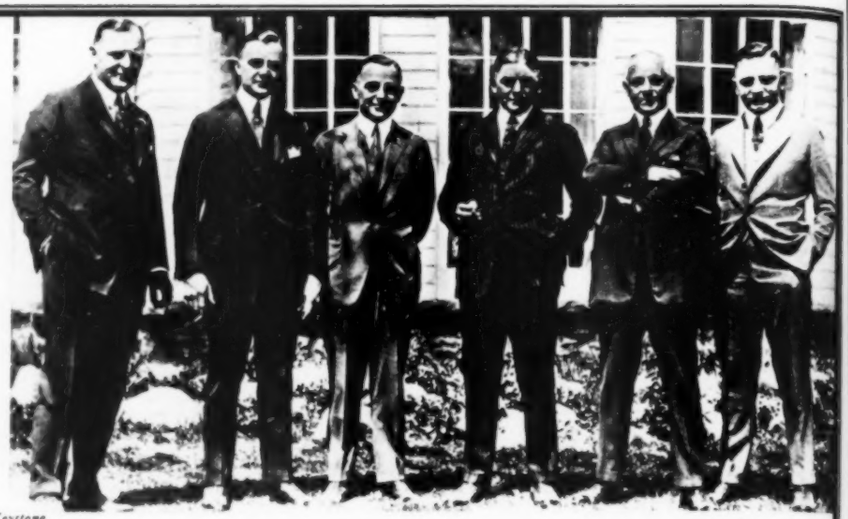
If the development of Duco is surrounded by rumor, the development of Ethyl gasoline is surrounded by myth. One legend maintains that Mr. Kettering got the idea of a red, anti-knock gasoline from noticing that all plants growing near the ground were red underneath. A more truthful version would be that Mr. Kettering, deciding that what motorists called knocking engines were really caused by knocking gasolines, started his laboratory working on a combination of gasoline and some anti-knock substance. Iodine removed the knock but damaged the engine. Xylene worked admirably but costs $150 a gallon. Silenium has an odor which won for silenium gas the title of "Kettering's skunk." Finally, however, they tried the tetra-ethyl-lead from which Ethyl gas resulted. And, despite the plant myth, the redness of Ethyl has nothing to do with its performance.

Mr. Kettering is tall and gangling, a little bit reminiscent of Abraham Lincoln and a little bit of Ichabod Crane. He still prefaces most of his sentences with "Say" or "Listen." Like so many General Motors men he has a yacht, but the Kettering yacht is such a compendium of electrical apparatus that an unfortunate workman, laboring on its keel, was one day sharply shocked. In each stateroom of the yacht there is a dial telephone and a catalogue of numbered phonograph records. The occupant of the stateroom first dials number 11, then dials the number of whatever record he wishes to hear, and that record, via a radio loud-speaker, resounds through his cabin. In Mr. Kettering's home in Dayton there are eleven Frigidaires.

Mr. Kettering's private life has remained private. He has a wife, a son (at Cornell), and he lives, when in Detroit, at the Book-Cadillac. He is fond of young people, has contributed extensively to the Boy Scout movement. He likes miscellaneous knowledge of all kinds; was once discovered whiling away the hours of a train trip by going through an abstruse work on the origin of the alphabet. Vigorously honest, he opposes the cult of mystery in science, he is also one of the few really epic characters in the American scene. Perhaps no other man could come to a formal dinner in a duck suit and remain the perfectly unselfconscious center of attraction.

Mr. Kettering has small patience with little minds; regards no organization, not even General Motors, as a miracle of efficiency; is irritated by personal politics, by divisional rivalries, by all people who are weighted with the inertia of existing conditions. He feels that not mechanical difficulties but stagnant minds are the greatest obstacles to progress.

COMBINING ability, money, and solidarity, the Fisher Family is hardly dwarfed even by the General Motors Family of which it is a most important component. There are seven Fishers—Fred, the oldest (53); Howard, the youngest (29), and Charles, William, Lawrence, Alfred, and Edward in between. All except Howard had had some experience at their father's blacksmith forge and, again excepting Howard, all are of the self-made type. A strong family feeling animates all Fisher activities. The brothers lunch daily at their Fisher Building (with no outsiders present) and there determine all questions of policy. Each Fisher brother has his particular night in the week for calling on his mother so that, with seven sons for seven nights, Mrs. Fisher is never lonely. Fred is the acknowledged leader of the clan.



Keystone

It was Fred and Charles who organized Fisher Body. In 1901, Fred was a draftsman for the C. R. Wilson Body Company of Detroit. The Wilson company at that time had rented a small portion of its floor space to one Henry Ford, who was then tinkering with a pre-Model T. One day a strolling photographer passed by, took a group picture of the Wilson employees and also of Mr. Ford. The picture now belongs to Fred Fisher (he bought it for $500 from its owner, a body mechanic who remained a body mechanic). Later Mr. Ford tried to buy it from Mr. Fisher, but Mr. Fisher said, "Henry, you haven't got money enough." Fred Fisher was prodded into starting his own company when the Wilson people refused him a five dollar raise.

It was after the Fishers had sold Fisher Bodies to General Motors for some $200,000,000 that they got into the market. At first they appeared to have been rather roped in, for a group of operators in Baldwin Locomotive thought that $200,000,000 was too much money for any seven brothers to possess and unloaded large Baldwin holdings on the Fishers. Then the operators sold Baldwin short and waited for the Fishers to become discouraged and close out their holdings. But the Fishers had the money and the courage to be their own Baldwin pool; and, joining with Arthur Cutten, purchased so much Baldwin stock that now Mr. Cutten and two of the Fishers are Baldwin directors. The Fishers became one of the mainstays of the 1926–29 bull market and though they quite literally lost a year's growth between October 23 to November 13, 1929, net increase in the ably managed fortune puts it at a currently estimated $500,000,000.

All the Fishers live in Detroit, in several million dollars' worth of houses and at least a million dollars' worth of yachts. Their philanthropies are quiet but extensive, and Fred (who is a Catholic) has had a Y. M. C. A. named after him. More than merely operating men, and with wide interests (notably in oil, steel, and railroads) outside General Motors, the Fishers have become a great financial interest. Thus in General Motors today there is a du Pont interest, a Morgan interest, a Fisher interest.

ALBERT BRADLEY is a financial vice president with particular interest in General Motors aviation affiliates. Like many other General Motors executives, he is college trained. But where Mr. Grant looks back to football at Harvard and Mr. Lynah to football at Cornell, Mr. Bradley remembers a Phi Beta Kappa key and a B. S. at Dartmouth and a Ph.D. at Michigan. He is, therefore, a somewhat rare specimen—the scholar in industry. The executive, as a type, is successful through an abundance of experience and a superabundance of energy, sometimes with a technical education to speed him on his way. An unusually able mind (in the pure, unapplied, academic sense) is rare in industry. Of course it is just as rare in the arts and the professions, and there are fully as many stupid musicians and stupid doctors as there are stupid vice presidents, but the industrialist has not yet grasped this point and quite generally suffers from an inferiority complex, which, fortunately, he will ultimately outgrow. Mr. Bradley may be said to have succeeded largely through his ability to grasp the theory of economics and finance (in 1917 he resigned an economics professorship at Michigan to enter the air service) and to apply that theory to the specific economic and financial problems of General Motors. And the trained mind as an industrial asset is well illustrated by Mr. Bradley, who, still in his thirties, is not only a General Motors vice president but also the chairman of Bendix Aviation's finance committee and a respected voice in General Motors financial counsels.

Mr. Bradley is stout, round-faced, chubby-cheeked, spectacled, with an habitually benign and almost beaming expression. In addition to golf, he is interested in bowling and prize fighting. He is extremely popular with his associates who, after enumerating his academic honors, will hastily add that he is really a very good fellow and "not at all a grind type." Mr. Bradley lives quietly on Fifth Avenue with his wife, his son, and his daughter. At a period in which it is conventional for the tycoon to read books and to hear operas, Mr. Bradley is in a position to read those books and to hear those operas for which he has a preference.

International

ALFRED H. SWAYNE is large, stout, and grey-haired, with somewhat the manner and appearance of the plain, blunt man—the proprietor not, perhaps, of a country store, but certainly of a country bank. In fact, however, he is metropolitan and cosmopolitan. Washington, D. C., St. Paul's, Yale, New York Law School, corporation and railroad counsel, broker, dollar-a-year man—such is Mr. Swayne's actual background. He lives in Manhattan with his sister, Eleanor. A brother, Noah H., is a Philadelphia coal man who has given negro spirituals on the concert stage. Mr. Swayne, Mr. Kettering, and Mr. Grant are the only three of the General Motors executives herein described listed in the Social Register—Mr. Swayne, New York; Messrs. Kettering and Grant, Dayton.

He is much more a finance man than an auto man. As chairman of General Motors Acceptance Corporation he supervises a yearly credit of about one billion dollars, a credit through which General Motors handles much of its wholesale, retail, and foreign distribution. It was back in 1919 that General Motors inaugurated the installment selling of automobiles; in that year installment operations totaled $20,880,988. There was a good deal of skepticism about installment sales in their early days but, as Mr. Swayne himself has remarked, "The American public is 99.81 per cent honest," and for the greater part of the past eleven years it has been nearly 100 per cent solvent.

Mr. Swayne also headed the institutional advertising committee and the department of publicity. It is these activities which, with the assistance of Batten, Barton, Durstine & Osborn, have sold the concept of the General Motors Family. There was a time, not many years ago, when General Motors was so little known as a unit that one large stockholder imagined that Pierce-Arrow was a General Motors product and another did not know that Cadillac belonged to the family. Distressing, also, was the fact that many a minor employee bought Durant and Star cars, thinking that Mr. Durant had still a General Motors connection. Now at least the public is well acquainted with the automotive operations of the corporation. General Motors carries good will and patents at $43,673,476, a figure rather oddly precise.

Mr. Swayne belongs among those excellent executives who can do an abundance of work with an appearance of leisure. His office is lined with etchings of famous financiers, of whom Andrew W. Mellon is the only contemporary. When he frowns a tornado-shaped cloud, with the funnel part at the top of his nose, gathers on his forehead. But he does not frown very often, and although he is not much interested in the more glittering hobbies of many of his fellow vice presidents, he finds time enough for good food, good pictures, good music. He likes to settle himself into a comfortable chair and philosophize on men and matters. At sixty (he retired, but only temporarily, in 1918) and with a job that would be overpowering for many a younger man, Mr. Swayne has retained a capacity for labor and, more remarkable, an enthusiasm for life.

U. & U.

JAMES DAVID MOONEY is head of the export and overseas group. The world is Mr. Mooney's village; the radio is his telephone; the *Leviathan* his commuting yacht. He has just completed a world tour, itinerary of which was scheduled as follows:

Dec. 6	Sail from New York
Dec. 14	Arrive London
Dec. 16	Take *Golden Arrow* to Paris
Dec. 19	Take Paris-Lyons express
Dec. 20	Arrive Marseilles and embark S. S. *Melosia*
Dec. 25	Arrive Port Said
Jan. 3	Arrive Bombay
Jan. 8	Arrive Madras
Jan. 16	Arrive Singapore
Jan. 18	Arrive Batavia
Jan. 27	Back to Singapore
Feb. 3	Arrive Hong Kong
Feb. 6	Arrive Shanghai
Feb. 9	Arrive Kobe
Feb. 10	Arrive Osaka
Feb. 15	Take *President Grant* to Honolulu
March 5	Arrive San Francisco

He is in London as often as in this country although he has an apartment in Manhattan and a house at Oyster Bay. But he is equally at home in any of the twenty-three export centers with which General Motors has so profitably sprinkled the earth's surface.

Mr. Mooney is young, Irish, restless, enthusiastic, and popular. He has an exceptional memory for names and faces—a memory which is one indication of that interest in people around which so much of his success has been built. He staffs his foreign offices, as far as possible, with natives; he employs native labor; he respects native customs. Mr. Mooney knows that a maroon car cannot be sold in Japan, because maroon is a color reserved for royalty; that yellow means mourning to the Chinaman and green bad luck to the Indian. Such facts flit through his mind as he speculates on how many cars can be sold in Central Africa in 1940. It has often been argued that the American business man abroad is not sufficiently observant of foreign customs and tradition, but against Mr. Mooney no such accusation can be brought.

Mr. Mooney also appreciates the difficulties confronting the American abroad. The wife of a General Motors' export man, stationed in a distant Asiatic station, was pregnant, and had little confidence in local obstetricians. She was therefore kept in daily touch, by cable, with her family doctor in New Jersey. After the baby had been born, in accordance with approved and modern instructions, Mr. Mooney cheerfully paid a communications bill which has subsequently become exaggerated into thousands of dollars.

Mr. Mooney, once a reporter, occasionally writes on the merits of industry. In the *Century Magazine* for August, 1928, he argued that man is distinguished from the lower animals by "the urge to create," that for a long time the creative impulse expressed itself in the arts, but that now "the gamut of all the arts has been run over and over again" so that "sounder mentalities" have turned to "applied science and . . . commercial and industrial progress." Posterity, believes Mr. Mooney, will consider the business man the creative genius of today.

Copper Briefly Considered

The "forever" of eighteen cents.

THINKING of America as a triumph of incredible cities, machines, trade-marked merchandise, ingenuity, energy, and salesmanship, Americans are inclined to forget what Europeans never forget—that our modern and industrial greatness has a ready-made foundation of "natural wealth." The world's first period of heavy copper consumption culminated during the War with the following statistics for production of copper in 1918—a ton being worth about $360, although it was then worth near $500:

United States	969,000 tons
Chile	118,000 tons
Japan	100,000 tons
Mexico	83,000 tons
Canada	58,000 tons
Spain and Portugal	51,000 tons
Australasia	49,000 tons
Peru	49,000 tons
Africa	34,000 tons

All other countries—less, much less, approaching zero.

Never again is the United States likely to produce such an elephant's share of the red metal. Indeed, ten years after 1918, the United States actually produced, for the first time since 1894, *less* than half of the world's copper. But so tremendous is the historic advantage of United States copper companies that they have come to own most of the South American production (to say nothing of whatever investments they or their financial associates may be making in Africa) so that copper, like automobiles, is predominantly, one is tempted to say exclusively, an American business.

But another but. Unlike automobiles, the copper business is a fully matured and hence beautifully organized business. The Webb-Pomerene Act permits American companies to combine to fix prices for export trade. So the price of copper shipped from the United States has been (since last spring's boom) neatly and definitely fixed at eighteen cents per pound domestic price (18.30 cents C. I. F., European price). But the laws emphatically do not permit American concerns to combine to fix the price of anything at home. Nevertheless, the price of copper delivered to the Connecticut Valley has been neatly and definitely fixed at eighteen cents. The Department of Justice has no complaint. It is a matter of maturity, not connivance.

Why eighteen cents? So calm and inflexible is the voice of an Anaconda or Kennecott spokesman when interrogated on the matter of price that it might be supposed there were some pragmatic sanction, if not biblical authority, for the proposition that copper is worth, now and forever, exactly eighteen cents a pound. The paradox is that the "forever" is truer than the "now." Let supply and demand have their way, and the price of copper would have fallen like an average stock on the Stock Exchange and at about the same time last year. But a hundred years from now it may seem incredible that eighteen cents could buy sixteen ounces of the one metal which is most perfectly suited for the electrification of the universe.

The coppermen come in between. They are not wasting office hours on the next century. And they are much too powerful to be buffeted about by a daily auction block application of supply and demand. If they were totally unreasonable in their demands for eighteen cents, the mere fact that they asked eighteen cents would be a reason. They have, however, good reasons. These reasons arise from some of the curious aspects of the business, a few of which we will recite:

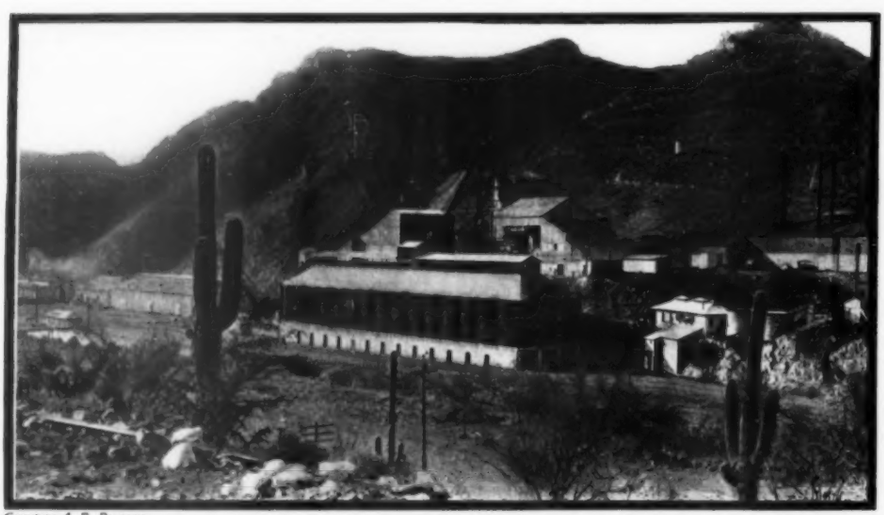
(1) During twenty-seven of the last thirty-five years (which is to say during the grown-up life of copper) the consumption of copper has increased simultaneously with the advance in price. In only three years did a low price stimulate purchase of copper. (L. C. Graton of Harvard)

(2) Copper is rarely an item of major expense in the uses to which it is put—e.g., cost of the building of a house or cost of telephoning your broker. This taken in conjunction with Point 1 makes it fairly certain that

(3) The consumption of copper depends upon general prosperity and hardly at all upon the price of copper; so much so that

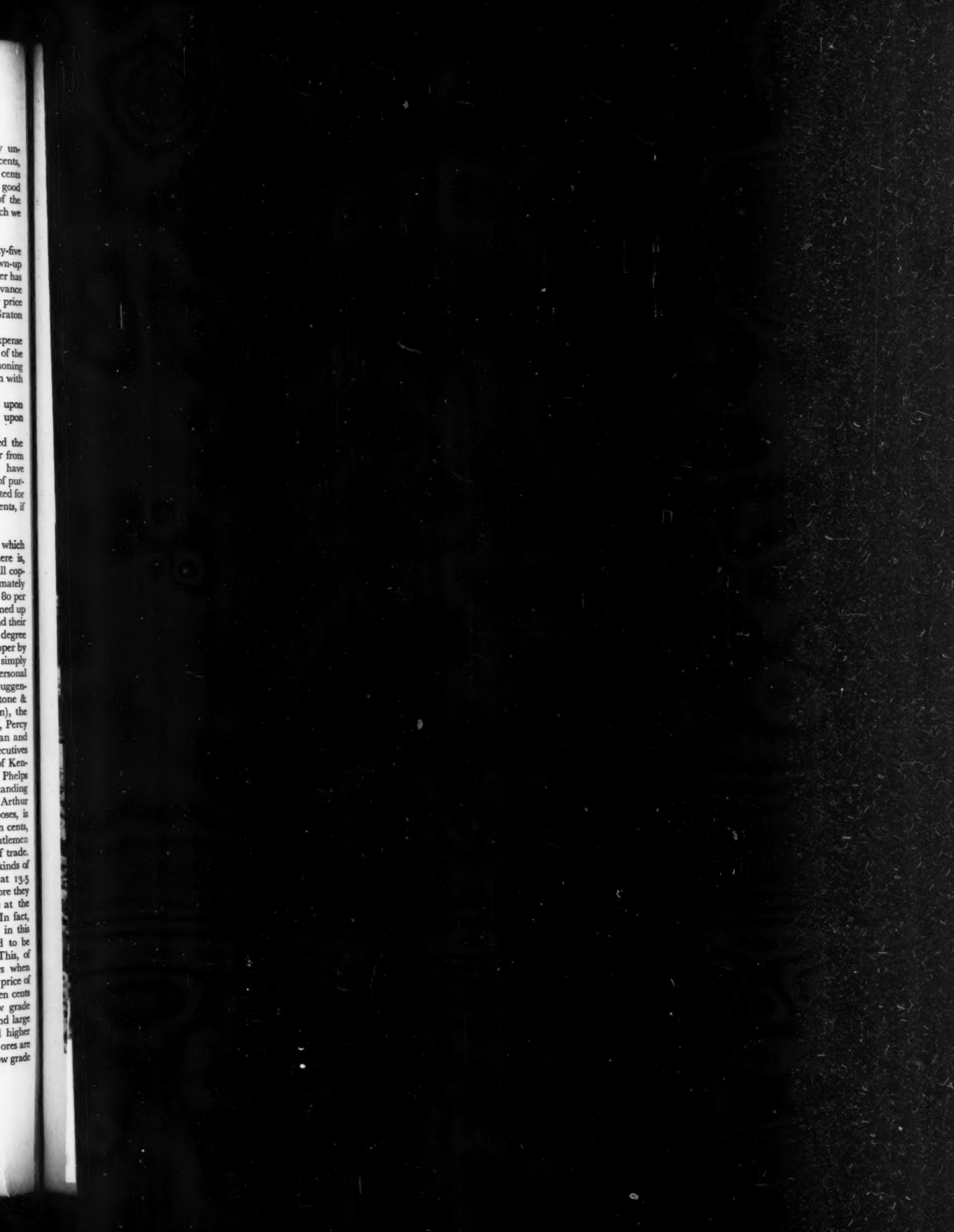
(4) If last winter, coppermen had reduced the price to say, seventeen cents, that, far from stimulating demand, would merely have caused such excitement in the ranks of purchasers that everyone would have waited for sixteen cents, fifteen cents, fourteen cents, if not free copper.

Along with these reasons must be set one which is close to the heart of the matter. There is, broadly speaking, no such thing as a small copper producer. America controls approximately two thirds of the world's production, and 80 per cent of American copper interests are summed up in Anaconda, Kennecott, Phelps Dodge, and their subsidiaries or affiliates. Only to a small degree can other producers affect the price of copper by offering to sell lower—because they simply haven't got enough of it. In terms of personal authority the list is surprisingly short. Guggenheims, the Morgan partners, Hayden, Stone & Company (in particular Charles Hayden), the National City Bank (Charles E. Mitchell, Percy A. Rockefeller), Executives John D. Ryan and Cornelius F. Kelley of Anaconda, Executives Stephen Birch and Daniel C. Jackling of Kennecott, Executive Walter Douglas of Phelps Dodge—there, together with a few outstanding capitalists like Nicholas F. Brady and Arthur Curtiss James—there, for practical purposes, is the copper business. As affecting eighteen cents, the point is certainly *not* that these gentlemen have ever agreed together in restraint of trade. The point is that all of them have two kinds of mines, some that would be profitable at 13.5 cents and some which would not. Therefore they are not only the "big fellows"; they are at the same time the "marginal producers." In fact, the outstanding achievement of copper in this century has been to turn what seemed to be unprofitable ores into profitable ones. This, of course, was done in the pre-War days when fourteen cents seemed to be the biblical price of copper, much as it is hoped that eighteen cents will become the par price today. Low grade ores are made profitable by efficiency and large scale production on the one hand and higher prices on the other. Naturally the best ores are apt to be mined first. So every year the low grade



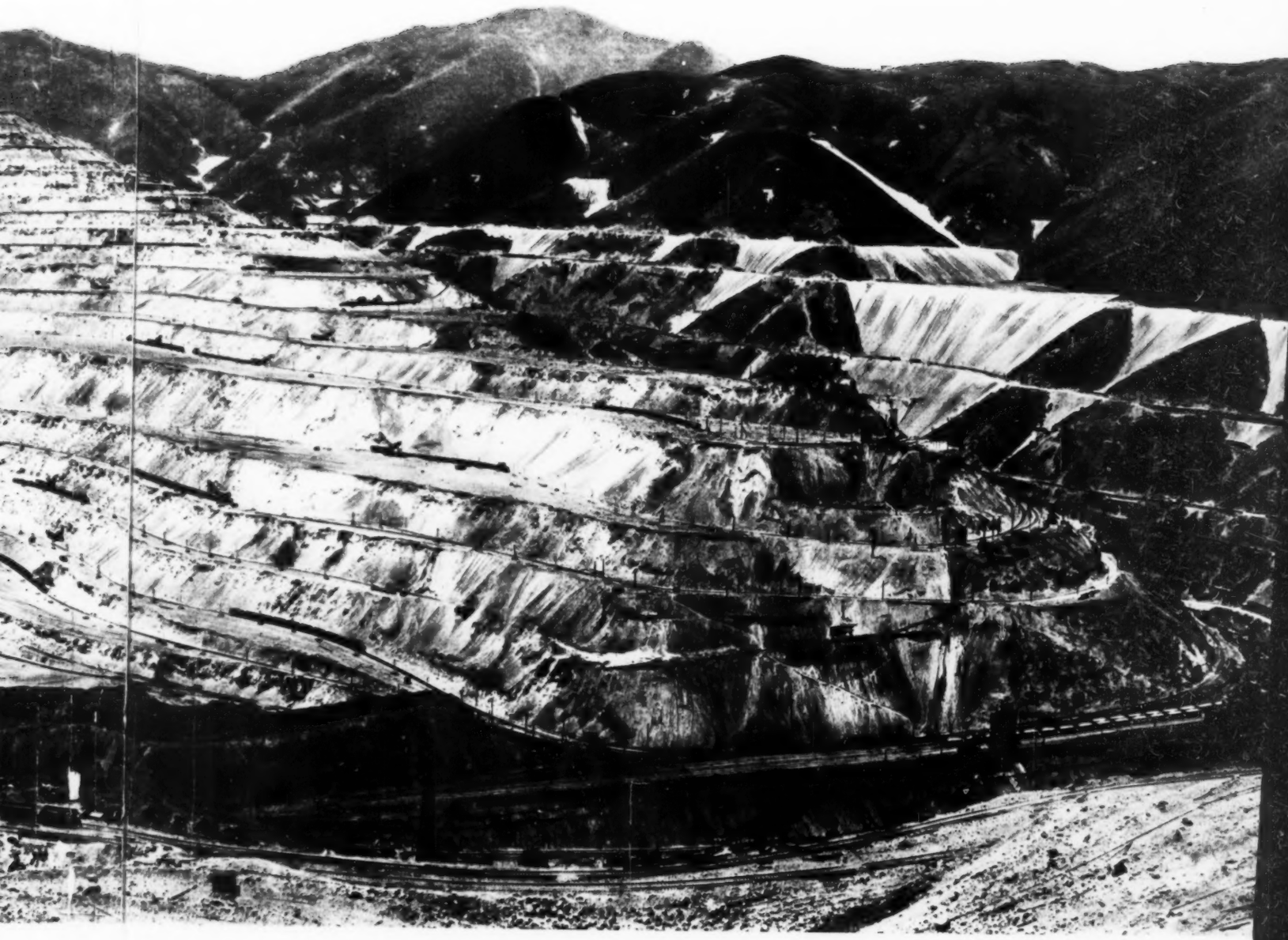
Courtesy A. B. Parsons

THE MAIN SHAFT OF RAY CONSOLIDATED, AT RAY, ARIZONA, A SIZABLE SUBSIDIARY OF UTAH



Open-Cu

pen-Cut Copper Mine near Salt Lake City whence Mr.



Mr. Jackling & men have extracted $500,000,000 of coppe

) of copper.

ore becomes relatively more important. So it is that all the great copper companies desire to maintain a price which will make their larger and lower grade ores profitable to mine and which will not restrict their mining to the diminishing first grade ores. The result of intricate calculations seems to fix an eighteen-cent rate as the price which will maintain the equilibrium.

From the nation's point of view such a policy seems wise, especially since the price of copper does not chiefly determine the cost of its use by John Citizen. And the great copper companies are so exceedingly strong financially that they are likely to be able to maintain whatever policy seems to them sound. (After this spring's peak of copper buying, a recession in copper prices is expected, but coppermen insist that this will not be a major compromise with the eighteen-cent principal.)

Africa

No discussion of copper, however brief, can neglect Africa. African copper is in itself a vast and magnificent story. There, within the last few years, has definitely been proven copper ores at once so abundant and so high grade (about 4 or 5 per cent, as contrasted with "normal" 2 per cent and Utah's 1 per cent) that all other discoveries pale before it in point of *possibilities*. By 1940 Africa may be producing as much copper as this country. Eventually it is certain to produce more. This in itself disturbs no one. For the increase in *consumption* of copper is likely to be so great that no one dares predict it. A few homely facts, such as that the Pennsylvania Railroad's present electrification plans call for 55,000,000 pounds coupled with the belief that *all* railroad lines may be ultimately electrified; that the brassification of plumbing is increasing 50 per cent yearly; such facts add up only too easily to the prediction that in 1940 the world will need 3,150,000 *tons* of copper, whereas now it is given only 2,000,000. Consumption, in short, is counted on to take care of Africa. The only trouble spot seems to be an outcropping of international feeling. During all these last industrial decades, Europe has had to bow to American copper. As long as copper moved "freely"—i.e., under the hammer of supply and demand—Europe had no complaint. But, if contrary to immediate laws of the hammer, the price of American copper should be held up, your European is apt to become resentful and to rush to Africa for relief.

However, this is speculative. For the immediate present the American copper business has little to worry about. Stocks of copper companies are expected to decline if the eighteen-cent price is allowed to break for a while. But fundamentally their position is as follows:

The past decade: Big money-making to offset the dark post-War days

[*Continued on page 130*]

World's Record Hill

The story begins 100,000,000 years ago.

STILL formidable, scarred, and unfriendly at the edge of its valley stands the Hill, which is the largest copper mine in the world. From it men have taken 3,161,000,000 pounds of copper. In terms of money, this has meant $500,000,000 for Kennecott's Utah Copper Company. In the mountain there remain 625,000,000 tons of copper ore. In terms of money this is unpredictable.

In Bingham, a town one street wide that straggles four miles along the Hill's gulch, live the miners of the Utah Copper Company; twenty miles away, beyond the foothills of the Oquirrh Mountains, the Great Salt Lake sparkles like a steel shield and across a green valley lies Salt Lake City.

• • •

Such is the end of a story which began in the spacious days of the post-carboniferous era, some hundred million years ago. Where the Hill and the town now stand there swept the waves of a forlorn Mediterranean.

Later, the floor of this ocean was raised into a plain beneath which lay stratified limestone and sandstone. Dinosaurs waddled down across it from the mountains in the west and foraged among the naked pithy stalks of its tufted forests. Some hundreds of thousands of years after the dinosaurs, a row of volcanoes stormed and smoked against the sky.

In the course of centuries, the volcanoes were worn down to the form of domed hills among which thermal springs steamed and glittered.

It was not until almost modern time—possibly 15,000 B.C.—that the glaciers advanced on a country already forested in spruce and pine. The Hill had by this time been shouldered up out of the porphyritic and salty strata of the plains, part of a range of mountains which the Indians, who later lived beneath them, called the Oquirrh. The huge salt lake that nibbled at its bottom shrank back across the plain where a few thousand years before the glaciers had retreated towards the north. The snows and rains of tens of centuries, fraying the Hill's rocky surface, exposed copper ore made in its depths and the columns of frozen lava in the throats of dead volcanoes.

Courtesy Utah Copper Co.

LOOKING UP BINGHAM CANYON AT THE BLUNT PROW OF THE HILL

Somewhere in Asia an ape crawled into a cave; men in Cyprus learned how to make brown swords and copper cups; a tribe of Indians rode their small horses across the desert plains of Utah. Sometimes they built small fires on the Hill, the signals of some dark and unremembered war. Perhaps an Indian stood on a nearby summit on the day when into the quiet, lonely country there came, finally, a long train of wagons and horsemen. The Mormons, bearded and sober, circled through a gap in the range on the opposite side of the valley and stopped to pray when Brigham Young declared, "This is the place."

If the Mormons ever learned of the treasure in the Hill they paid no attention to it. Changing the desert into a garden occupied all their time. They needed protection only from the Indians, and for this purpose the generous Goverment provided a platoon of the Californian Volunteers who were stationed nearby, at Camp Douglas. The officers, unlike the Mormons, liked picnics. On a summer day in 1862, after lunching beside the stream that gurgled in the rocky gutter of Bingham Canyon, they dispersed, each with a lady friend, to investigate the Hill. One of the ladies found a shiny stone and she showed it to her escort, saying, "Now what kind of a stone do you call that?" Such is the legend of the Hill; no one remembers the lady's name.

The officers spent their afternoon scrambling among the underbrush and filling their pockets with the first rubble that was ever carried from the copper mountain, but, in the game of find-the-thimble which is mining, they were only growing warm. Though the forgotten lady with her question had hinted at the previous secret, the men who swarmed into the canyon afterwards were not looking for copper but for gold.

The story of the Hill, for millions of years, had been a quiet wordless story, written by the rains and the slow suns setting; it became, suddenly, the history of the town that sprang up, in a four-mile row of rickety flophouses, brothels, and saloons, along the canyon. Its long crooked street flared with the bizarre and sinister excitements of the gold hunters. There were quick duels in its barrooms, and its hungry dream-ridden adventurers cursed or fought in the street at night and scoured the sides of Bingham Canyon during their day. By that time everyone knew that there was copper higher up and deep in the Hill, but even the richest veins of ore were narrow and assayed only about 2 per cent copper, and to a miner whose claim was called the "I Don't Care" that was not enough copper to bother about.

It was for silver and lead that General Patrick E. Connor, a famous Indian fighter of the district, got his friends together in 1863 and staked out the first real important claim, the Jordan. The Jordan remains today the claim on which is the main shaft of the United States Smelting, Refining and Mining Company which, with mines in Mexico, Alaska, and half a dozen states, began to take over the old claims and early companies as the gold and silver prospectors moved away. Today, this company (except for half a dozen minor companies) shares the district with the Utah Copper Company.

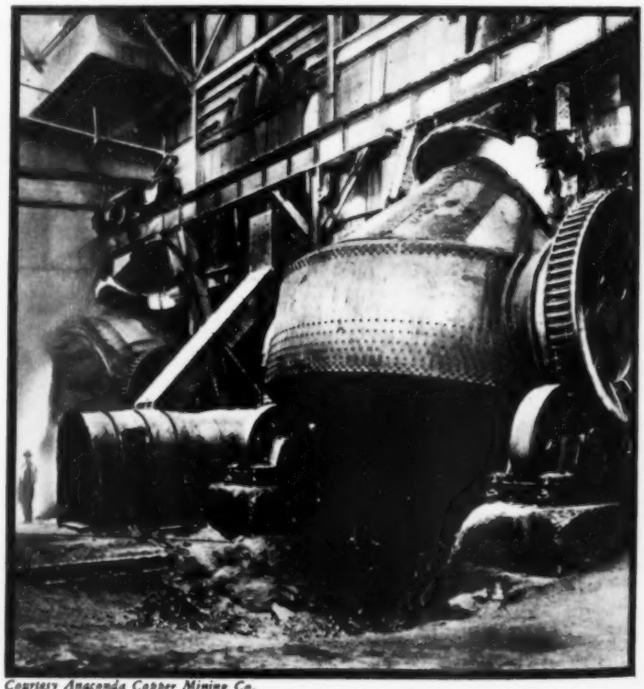
Even at the turn of the century, no one knew a way to mine 2 per cent ore profitably, and there was not, then, the huge demand that has come with the growth of electricity and the discovery that electric power can be laced to the ends of the earth with copper wire. With that demand necessity found a way, so that today 2 per cent copper ores are considered relatively rich and even 1 per cent ores are mined in great quantities.

Daniel C. Jackling, in 1904, organized the Utah Copper Company. Instead of digging into the Hill and laboriously carving out of a porphyritic setting its scanty ore, he shoveled the Hill and the ore together into gondola cars which began to rumble, in the shuffling, regular rhythm of mass production, nineteen miles around the foothills of the Oquirrh Mountains to his milling plants. In 1904, if you had a big mine, you might take out a thousand tons of ore a day; each day Jackling now decreases the size of the Hill by nearly 100,000 tons of ore and dirt.

The appalling figures of the Hill's antiquity are less appalling now than the figures of its destruction. Twenty-three electric shovels grunt in the grooves along its sides, biting ten-ton chunks out of the rock, which they spew with fretful repetition into the apparently endless train of gondola cars which forty electric locomotives draw up and down the tiered declivities along eighty-two miles of railroad track. Three hundred and eighty million, nine hundred and eighty thousand tons of earth and copper have been in this manner taken away already. The smooth flank of the Hill has been carved into twenty-five amphitheatrical rows, separated by cliffs some sixty feet high. Along these convex levels, 2,100 miners blast the ore out of the rock, govern the shovels, brake the freight cars, and point their drills against the stone. Three billion, one hundred and sixty-one million pounds of copper have been taken out of the Hill, 10,200,000 ounces of silver, and 1,000,000 ounces of gold. The amount which these are worth, $520,100,000 would have paid for the digging

[*Continued on page 134*]

Courtesy Anaconda Copper Mining Co.
HE WORKS FOR ANACONDA, UTAH'S GREAT RIVAL



Courtesy Anaconda Copper Mining Co.
AN ANACONDA CONVERTER IN PONDEROUS ACTION

CARNEGIE LIBRARY OF ATLANTA

Daniel Cowan Jackling

Operating genius of Kennecott and Utah.

International
MASTER OF PORPHYRIES: "JACK"

THE rampant, two-fisted heroes who whelped the American copper industry have rushed on to their stormy Valhalla. When thunder rolls and crashes, more than likely it is Fritz Augustus Heinze sapping and blasting under some other tough old angel's cloud, showing off to Thor and Odin the trick with which he took more than a million dollars' worth of Montana copper in the wild nineties at Butte. Fritz, until he joined forces with him in a daring, freebooter's escapade, was Clark's bitter enemy—the Hon. William A. Clark, who died a United States ex-Senator in his Fifth Avenue mansion of 121 rooms heated by a furnace which burned seventeen tons of coal a day—and Clark was the grandest, most productive frontiersman of them all, not excepting even Irish Marcus Daly. When bolts of lightning shoot from Valhalla hot and blue, it is only Clark and Daly saying in a gusty, forceful way what each thinks of the other—the coyote, the dog robber, the two-bottomed baboon!

That was copper, that used to be copper. Snarling, clawing, crippling your rivals, then, while they howled with tails between their legs, nuzzling down to suck the rich, bright blood from Nature's swelling veins. But copper is not like that now.

Copper today is a product of the laboratory—rather of the biggest laboratories in the world. A whole mountain at Bingham, Utah, has been put on a scientist's worktable. He scoops it up in ten-ton measures, puts it through test tubes and retorts made not of glass but of steel and into strongest refractories, turning out at last a product as chemically exact as the pills your druggist makes.

Moreover, rich rewards are achieved working with an ore so low in copper content (1 per cent and less) that it used to be called not ore but simply "dirt." The man—the scientist on a giant scale—who created the laboratory that is test-tubing and abolishing a mountain is certainly a genius. His workmen in Utah call him "the boss." His rich neighbors in California call him "Jack." But Wall Street and the East know him from afar, with huge respect for his demonstration that lean dirt can be turned into fat millions, as "Mr. Daniel Cowan Jackling."

People with money

Jack is big (6 feet 1 inch, 225 pounds), breezy, direct, inspiring. But Jack is also thoughtful, a high-geared brain worker, wholly dependable, and, when pains must be taken, slow. His great initial problem was to get money, and bankers do not trust a man who moves too fast, especially in a new direction. Back in the years when Henry Ford had not yet shown the way to mighty profits from mass economies, Mr. Jackling dreamed and fashioned his vision of what could be done with stupendous tonnages of low grade ore and then, as he recently said, "I lost no opportunity of talking about it to people with money."

Having heard, the people with money wanted to be shown. Who was Jack anyway? An orphan, for one thing, like that other mining engineer, Herbert Hoover. His father and mother ran a forwarding business over the Santa Fe trail at Hudson, Missouri, before there was a railroad. Aged two, he was taken in by his maiden Aunt Abigail, who next took a husband. Pioneers by nature, the newly-weds and Jack pressed on into the West, seldom farming in one place for more than a year, poor and with little learning, but healthy, self-reliant.

"Got my banker!"

Owen D. Young has told how, as a hot and tired farmer boy, he was inspired to enter his present profession by the sight of some lawyers actually making money arguing at their ease in the cool county courthouse. Similarly Daniel Cowan Jackling was dazzled into the career of school-teacher by the success of a friend who was making thirty dollars a month and board. If teaching were only better paid, Jack might still be a pedagogue as Mr. Young remains, by definition, a lawyer.

In the early nineties eager young Professor Jackling was already chief of the chemical department of the Missouri School of Mines at a salary which must have seemed munificent. But the quick brain of Jack was and is a two-way street. He retraced his path to penury, grew hungry and glum in the gold mining camp at Cripple Creek, Colorado, looking for the job he had decided would have a bigger future than teaching. Within thirty-six hours, nineteen mines refused to have him. By a mere fluke, after he had spent his last copper, he finally got odd-job work at J. C. Staat's assay office in 1894, and within the year was in charge of the Florence Reduction plant and then chief metallurgist of Captain De Lamar's company in Mercur, Utah. For the next ten years he was building up his reputation as an efficient gold and later copper mining boss, but as early as 1898 he was sent to report on the mountain of low grade copper-bearing porphyries at Bingham, Utah, and, though years passed before anyone else could see with his eyes, the vision of its possibilities grew and swelled.

In 1903 the Man of Vision tried but failed to get an option from the principal dirt owner at Bingham, a certain Colonel Wall. More than ever earnestly, glowingly, and interspersing figures with funny stories did Jackling now talk to people with money. They grudged, but loosened up just enough to give him a chance to prove the methods he proposed. This could not be done in an ordinary laboratory, any more than Henry Ford could have proved straight line production with paper doll workmen and an assembly line of autos made from penny match boxes. The proof of Jack's pudding was ascertained on a working scale which was then considered, and is still considered, of great magnitude, using a concentrator for the ore of some 700 tons per day (1,400,000 pounds) capacity. There was no basic new invention, either by Mr. Jackling or anyone else. His supreme genius is as an organizer. It is characteristic that he was the first to use the steam shovel in mining. A coördinator, he was a man who constantly surprised and sometimes chagrined the makers of the best and strongest and most expensive machinery by ruthlessly rebuilding, changing, and adapting it to work with greater speed at higher efficiency. After a year and a half of tireless tests and preliminaries, Jack began to have great news . . .

One of the first people with money to grasp fully the enormous significance of what Mr. Jackling had proved he could do was cosmopolitan Charles Hayden. Three cold million dollars were now needed by Jack, who ten years before had stood hungry without a copper in his pocket. Associates of Mr. Hayden, very important among these being the Guggenheims (now Murry, Solomon R., and Harry F. Guggenheim are directors of the board of Jackling's Utah Copper Company), joined him in supplying the three million, and when more was needed, more. Some $10,000,000 all told was invested in what is now Utah Copper Company. Dividend returns have exceeded $204,000,000, and the company retains a surplus of $68,000,000. Incidentally, Charles Hayden is today first vice president of Utah Copper and, in that small particular, subordinate to President Daniel Cowan Jackling who, if he were so minded, might paraphrase a popular post-War ditty thus: "I've Got My Banker Working for Me Now!"

"Let me send for Jackling," said Barney Baruch to someone close to Woodrow Wilson, when the army, the navy, and the Allied governments were deadlocked with American explosive makers in regard to what ought to be the price of war explosives.

Protesting that he knew nothing about explosives, which was almost true, Jack came to Washington for a dollar-a-year as director of Government explosive plants and, in the estimation of Mr. Baruch, "saved the Government a minimum of $43,000,000 and a maximum of $58,000,000, a considerable sum even in these days of billions."

One of the great industrial triumphs of the War was Mr. Jackling's completion of a $100,000,000 explosive plant in approximately one hundred days from the time ground was broken to the production in quantity of T.N.T. Again he had shown consummate organizing genius, and Congress voted him its highest gift, the Distinguished Service Medal. When the chorus of sneers at dollar-a-year men began to rise, General Hunter Liggett said shortly and decisively: "I consider myself honored in being permitted to bestow the Distinguished Service award on Mr. Jackling for the War Department." Hired for one hundred cents a year, Jack saved money at the rate of more than a dollar-a-second, which, after all, is only $31,536,000 a year.

Jack in Bantuland

Just now Mr. and Mrs. Jack and three friends are cruising on his newest, most splendiferous yacht along the only continent which American coppermen fear—Africa.

The narrow limits within which American coppermen work is suggested by these facts: Jack gets approximately eighteen pounds of copper from a ton of Bingham ore, and, with copper at its present price of eighteen cents per pound, this means that for $3.24 he must dig out the ton of ore, haul it to the mill, grind and

Cliff Bray
ONE OF UTAH'S TWENTY-THREE ELECTRIC SHOVELS

Cliff Bray
"JED" SHILLING, IN CHARGE AT BINGHAM

concentrate it, haul the concentrate to a smelter, smelt it, deliver the refined copper to the buyer, and still make a profit.

The average content of American ores in sight is 1.75 per cent copper, whereas in Africa it is about 4 or 5 per cent. There is no American mine remotely comparable to the just discovered mine of 35,000,000 tons of ore reserve averaging 9 per cent copper, which is as yet unnamed, but which lies in northern Rhodesia, a part of the Rhodesian Congo Border Concession.

At this time the African fields both in the Belgian Congo and in northern Rhodesia, but particularly in the latter, are on the brink of developing from large to vast production. It is true that wages for native labor are very low—twenty-four cents a day in Rhodesia. But the natives are so worthless, even at that price, that there is much talk of importing white labor. Also, the long haul from Africa is a great factor in favor of American producers. But all the same they are gravely worried.

Pleasure

This yachting to Africa is not strictly for business. On the contrary, it is the result of a day many months ago when Jack determined that, since he had never been around the world, he would forthwith go. And forthwith he went. That for him the itinerary should include Africa was as foreordained as that a college youth should include Paris or an artist, Italy. For many years Jack's yacht has afforded him the most perfect combination of business and pleasure. Especially familiar to the icy waters of Alaskan bays was the famous old yacht he sold in 1917 for $650,000. He named it romantically the *Cyprus*—after the island from whose name the word copper is derived and on which early Romans dug their metal.

Generous in the broadest, fullest sense, Mr. Jackling seldom yachts, hunts, or enjoys any other recreation unless he can share it with several friends, "several" usually being about fourteen. Fish stories he does not tell, but he spins yarns about wild turkeys with the gusto of a southern colonel launched upon that grand theme, "niggers." (Friends of Jackling seldom call him "Colonel," though he has served with that rank on the gubernatorial staffs of two states—Colorado and Utah.)

"One time, sir," says Jack, grave faced, "one time I saw a buck turkey—these birds can run faster than other birds fly—one time I saw an old buck catch up with a charge of buckshot and another one running a mighty close heat with a rifle bullet. Run—why those turkeys just barely touch the ground with their toes and use their tail feathers like a rudder! They're as fast as an airplane and a lot too fast for any ordinary hunter."

Fortunate will be those copper initiates who may presently hear him talk no less vividly of Africa. For while Africa is not his bailiwick—out there the great name of Beatty shines—Daniel Cowan Jackling occupies a unique position among all American coppermen. He is not merely the genius who turned the lean porphyries into wealth so that in spite of all the ore mined since 1904 we now have more usable ore than when he opened Bingham Canyon. He is also the operating genius of Kennecott, pride of Guggenheims, Morgans, and Charles Hayden, which, on two continents, produces more copper than any other company, and shares with Anaconda the dominance of the whole industry. To him, the bonanza mines of Africa and their peculiar problems, so different from those he faced and vanquished, must constitute a fascinating challenge to genius. For Jack may be considered as having arrived at that position where the problem holds more fascination than the result.

Courtesy A. B. Parsons
HE WORKS (AS LITTLE AS POSSIBLE) FOR KATANGA

WAR. *This and the following pictures are by the ace of aerial photography—Captain Alfred G. Buckham, concerning whom there is a note on page 18*

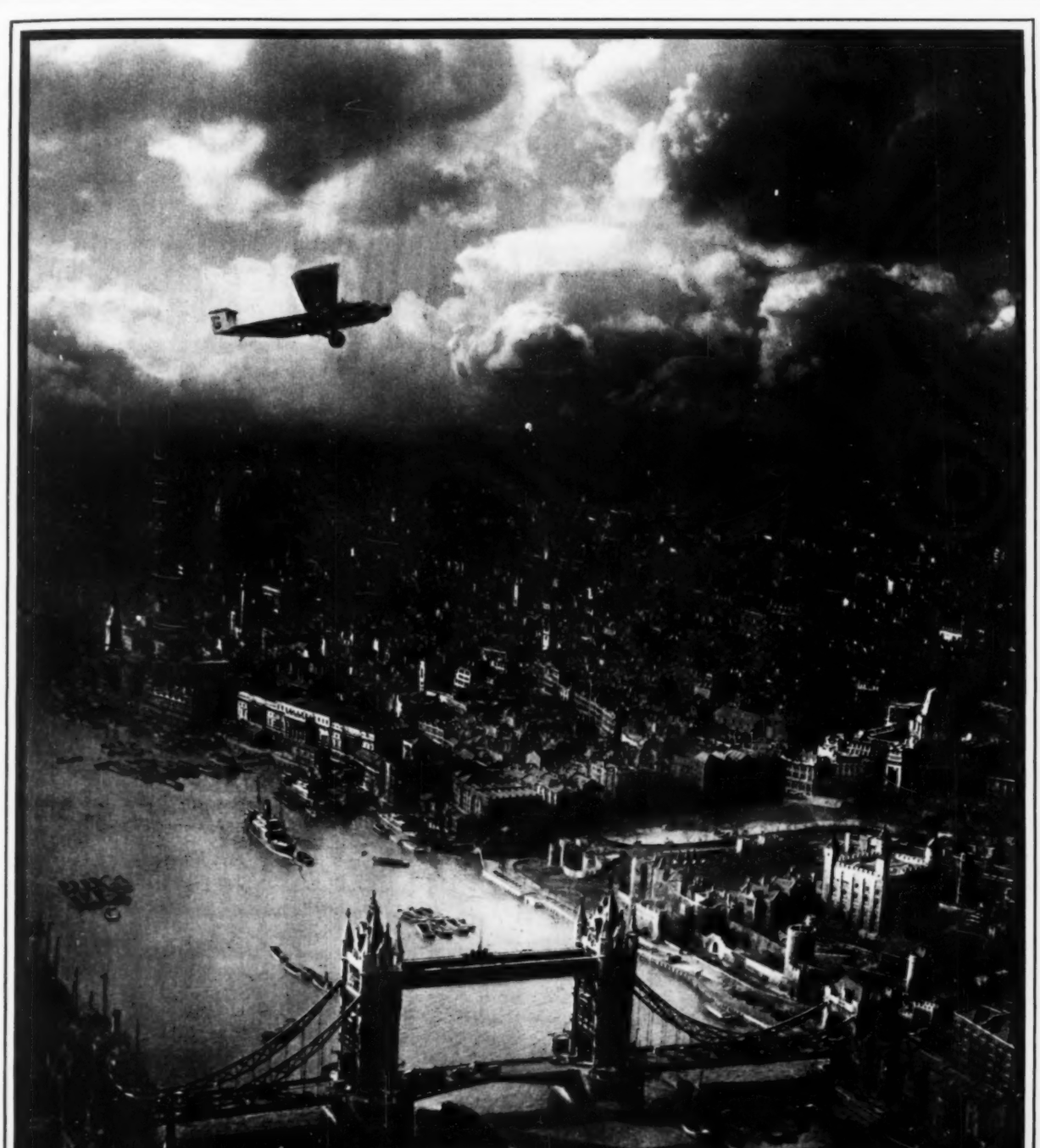
SCOTLAND'S CAPITAL SHOWING EDINBURGH CASTLE, PRINCESS STREET, AND MANY A KIRK

CARNEGIE LIBRARY OF ATLANTA

THE RIVER FORTH BEFORE IT BECOMES A SHIP-LADEN FIRTH

DOWN THE RHONE INTO FRANCE FROM ITALY

CARNEGIE LIBRARY OF ATLANTA



EUROPE'S GREATEST PORT AND CITY: TOWER BRIDGE. (*The great building behind the Tower of London is the post of London authority*)

Air & Rail

A fluttering industry considers its ailments, takes counsel from the kindred industry of the rails. Its principal problem being neither overproduction nor crashes, but management.

AS THE WAR gave aviation its first great impetus, so did the War give it a flavor. For a decade after the last young ace drained a flask of Scotch and jumped into the cockpit of his bomber, the fine flavor of recklessness hung about this new-born sport and industry of the air. As a result, while the world's store of adventure and romance was measurably renewed, very little was added to the world's knowledge of transport.

For transport is a different matter altogether. Transport is not created in a series of gallant, superhuman bursts, but by sustained and sober effort. There is not time, figuratively or literally, for flasks of Scotch in the transport business. General Atterbury proudly told a House committee: "Railroad employees have been at all times, and are today, the most temperate body in any industry." Such men are necessary to transport; they are the proper complements of schedules and safety and economy.

Thus aviation, which was resolved at all costs to become transport, had to get rid of the flavor left by the War and its daring aces. This, in the year following the great trans-Atlantic flights, it set out to do, calling the process "getting down to business." In that year, production of planes jumped from 1,995 to 4,345, and all of them were sold.

• • •

It was then freely predicted that the airplane would become as common as the automobile, that we (as citizens, as sportsmen, as business men) would move about our appointed tasks via the air. Innumerable chambers of commerce staged innumerable pageants of transportation in which the last float showed us about to soar to a conference or a dinner party. There was every reason to expect the float to be a roaring success. Not to submerge its predecessor, the automobile, perhaps, any more than the automobile submerged the train or the train submerged the ship. But certainly to call forth as many cheers and checks as any of these.

The cheers it has. They deafened a thousand cities throughout the summer of 1927, and their happy echoes heartened the airmen in 1928 when aviation was "getting down to business." In 1928 and 1929 they built 928 airports; they produced 10,080 planes; they made us all air-minded. Ask any business man. "You bet I'm air-minded . . . aviation is the coming thing . . ."

Thus the cheers; strangely, the checks did not follow. And in 1929, when the railroads piled up the highest net incomes ($1,274,774,188) in their history, fully half the aviation industry lost money.

• • •

Something, obviously, was amiss. In spite of an intricate structure of holding companies, operating companies, manufacturing companies, the aviation industry was not yet a going concern. Such glamorous publicity had attended its rise as never before illuminated an industrial enterprise (cf. the stock market manipulations which attended the birth of the railroads: Lindbergh v. Jay Gould). It was comparatively free from the governmental interference which has so often balked and baffled the railroads. No lack of capital hampered it; while the first railroads turned to England and Holland for support, the aviation companies were generously nourished in New York and Boston and Chicago. It had the tremendous advantage of timing its birth to coincide with the very peak of national prosperity. Yet it had somehow failed to "get down to business."

Many immediate explanations suggested themselves. The most usual was overproduction. By the latter half of 1929 the demand for planes had noticeably slackened, while the expansion programs of the manufacturing companies were in full swing. In all, some 6,034 planes were built and nearly 800 remained unsold. Many of the smaller companies closed down altogether, and the larger ones are now running with skeleton organizations. More companies will fail within the next nine months.

After overproduction, the reason most commonly given for the industry's setback was fear. A perfect plane flies proudly like a white, snarling bird in the blue desert skies above Albuquerque in New Mexico. The ship flies into thunder. Skies darken and are illumined again by lightning. The ship flies to oblivion and the passengers to death in flames. It is an easy thing for the citizen to remember, much easier than statistics. (January–June, 1928: one death in every 169,944 miles flown. January–June, 1929: one death in every 442,530 miles.) The business man, noisily air-minded, quietly avoids the air.

A third reason is expense. While railroad fare approximates five cents a mile, the passenger lines were charging ten cents. It cost the Los Angeles business man about $300 to fly to New York. Planes with capacities of fourteen and fifteen took off with one or two, or four or six passengers. As it costs somewhere between $1.00 and $1.25 to fly a fourteen-place, tri-motored transport plane one mile, a revenue of forty cents or sixty cents a mile leaves a considerable deficit.

Each of these three factors—overproduction, danger, and expense—without doubt played its part in the debacle of 1929. The stock market crash aggravated it. The failure to realize that airplane buying is seasonal (Who would buy a plane at Christmas?) was another cause, as was an uncertainty on the part of the manufacturing companies as to just what they were attempting to do. This year they must decide whether they are selling airplanes as General Motors sells automobiles, a plane for each purse, two planes for each family, or are making transport equipment as American Car & Foundry Co. makes locomotives and coaches and freight cars. The airplane must renounce its kinship, either to its yokefellow the automobile, or to its yokefellow the train. If it abandons its dream of the World-in-the-Air, it must concentrate on the problem of fulfilling its function as

a carrier. And the best way is to imitate the railroad.

For behind and beyond the many contributing difficulties of 1929, however, there is a more general trouble which includes all of them. While the War flavor of adventure has been divorced from aviation, the compact organization of business has not taken its place. The industry is still haphazard, confused, opportunist. As 1930 opens, its most responsible leaders are thinking not so much of overproduction and crashes as of the curiously unromantic problem of personnel. The measure of the industry's recovery, it becomes apparent, is the measure of its organization. "Get down to business" is particularized into "Get down to railroading." Just how much readjustment is required and just how to achieve it are the current preoccupations of the industry.

Organization and personnel

Already the industry has an elaborate framework. It has merged and integrated quite as energetically as industries many generations its seniors. Within the two years which have elapsed since the end of the Trans-Atlantic Era, there have come into intricate being at least four major groups which present all the appearance of large, integrated industrial units. They are briefly summarized in this article. As each group includes practically every branch of the industry, each group has shared in the 1929 depression.

There is nothing inherently unsound about this framework. Its weakness lies not in its structure, but in the bricks upon which it relies to fill it in. Here is an industry which assembles its parts, concentrating its direction in the hands of a few executives, and then fails to find the executives. Of all lessons to be learned from the railroads, management is the first and greatest. It was poor management which allowed the entire industry to expand while demand was slackening; poor management is responsible for the wild fluctuation in the industry's rate schedules. Every intelligent critic of the industry recognizes this weakness.

Not every aviation executive is incompetent, of course, and the two years of integration have developed a few distinguished leaders. Outstanding among them is Frederick B. Rentschler, once the president of the Wright Aeronautical Corp., the organizer of Pratt & Whitney Aircraft Corp., and now not only the President of United Aircraft & Transport Corp. but as distinguished a figure as the industry can boast. It is possible to estimate that the profits of the aviation industry in 1929 totaled $15,000,000. Of this, United Aircraft & Transport was responsible for more than $9,000,000, and the credit for this bright showing in a dark year falls squarely on the shoulders of Mr. Rentschler. Aviation needs more Rentschlers and fewer stockjobbers, pilots, and promoters in its management.

Leaving the actual management division of the industry, the personnel picture becomes considerably more cheerful. It includes many excellent engineers, sturdy Giuseppe Bellanca serving as a good example of the type of engineer who constantly works toward a solution of the problem of proper equipment. And its pilots are steadily improving as their experience increases. Few pilots on transport lines have less than fifteen hundred hours of flying behind them, although their licenses require only two hundred. By December 31, 1929, there were 9,815 active pilots licensed in the country, while 30,000 student permits had been issued. Flying schools, which began in a rather haphazard way, are now handling their vitally important work more seriously and more intelligently. The Curtiss-Wright Flying Service is a notable leader.

[*Continued on page 84*]

Aviation's Aces

Three Good Engineers

"The flight," said Giuseppe Mario Bellanca, "has not added anything of moment to the science of aviation." The flight in question was made by Chamberlin and Levine, from America to Germany, and in the Bellanca-designed cabin monoplane, the "Columbia." Bellanca, a tiny five-foot-three Sicilian, has been responsible for the cabin monoplane's design and popularity. Now, at his own Bellanca Aircraft Corp. at New Castle, Delaware, he is at work at designs new and old.

"A very good test," observed Igor I. Sikorsky, "of the strength of that wing structure." The test was the crash of one of his multi-motored planes, piloted by himself, against a large and sturdy tree. The plane was scratched, but the tree was gouged. The first to build successful multi-motored airplanes (in Russia, in 1913), his current interests are centered upon amphibions.

Anthony H. G. Fokker was born in Java, was educated in Holland, became famous in Germany, and now, just turning forty, lives in the United States. Planes of his design fought the War for Germany, carried Byrd to the North Pole and across the Atlantic. Still one of the air's best engineers, he has allied himself with General Motors and Western Air Express.

Three Good Pilots

"I guess we can't go today, Daddy," said John Doolittle, to James Doolittle, as the Doolittle family looked at the damaged Lockheed Vega plane that had broken its landing gear before leaving the ground. So Lieutenant Doolittle, who in January resigned from the Army to take a position with the Shell Oil Company, went West by train. One of the older generation of aviators, the Lieutenant is famous for his experimental "blind" flying and holds the official U. S. seaplane speed record of 245 miles per hour.

Trans-Atlantic aviators who come down in mid-ocean are usually heard of no more, but George W. Haldeman was fortunate enough to land his plane in the vicinity of a Dutch oil-tanker. For it was he who piloted the plane in which Ruth Elder unsuccessfully attempted to become a girl-Lindbergh. Now he is testing Bellanca planes at New Castle, Delaware.

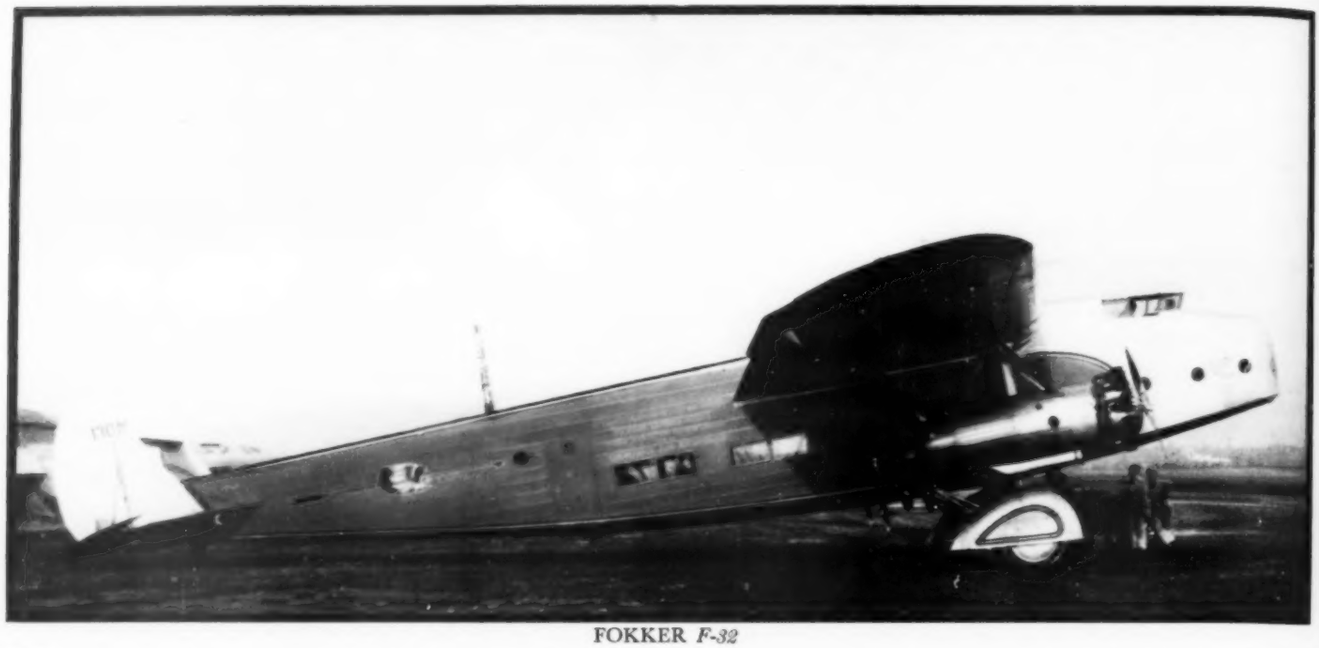
The ranking air mail pilot of the United States is E. Hamilton Lee, whose flights add up to a total of more than 1,250,000 miles. Pilot Lee has been flying for some sixteen years, has spent some 13,000 hours in the air (more than 8000 in the air mail), and has never had a serious accident. He flew on the first air mail line established by the government and was a pioneer pilot on five divisions of the New York–San Francisco route.

Three Good Presidents

Harris M. Hanshue twenty-five years ago adopted the young automobile business and five years ago took on another infant industry when he organized the Western Air Express. He began with a contract to carry mail between Los Angeles and Salt Lake City, points between which his line now brilliantly operates mail planes by night and twelve-passenger cabin planes by day. In 1928 Mr. Hanshue bought control of the Fokker Aircraft Corp., now linked with General Motors.

Frederick B. Rentschler was born to engines before the air age. At Hamilton, Ohio, Rentschlers made marine engines and sugar machinery. From Wartime service he emerged to become president of Wright Aeronautical Corp., where he quarreled and departed to Pratt & Whitney Co. Recently he brought Pratt & Whitney Aircraft Corp., second largest airplane engine company, into the successful United Aircraft & Transport Corp.

Juan Terry Trippe is head of Pan-American Airways, which operates some 13,000 miles of air line. Mr. Trippe's first experience in air transport came when he got the air mail contract between Boston and New York—the first private contract granted by the government. Now he has the largest air line in the world.



FOKKER *F-32*

THE most commodious plane yet built in the Americas is the Fokker *F-32*, above. That skilled Dutchman, Anthony Herman Gerard Fokker developed this ship in his United States factory at Hasbrouck Heights, New Jersey. It is a high-wing monoplane and that single wing spans ninety-nine feet. It has 1,350 square foot area, sufficient space for the construction of a five-room cottage. Below the wing and at each side of the cabin are a pair of Pratt & Whitney *Hornet* motors rigged tandem, furnishing 2,100 h.p., which can drive this great seven-ton plane plus its four additional tons of useful load at 157 m.p.h. The usual traveling speed, that is, the cruising speed, is 120 m.p.h. The plane lands at the express train speed of 60 m.p.h. Those half ellipsoid hoods over the wheels are their "pants," which reduce wind resistance by a great amount. The cabin contains four rooms, with adjuncts of a kitchen, a clothes closet, and two lavatories. Passengers can walk fully upright in those rooms, or they may sit in thirty softly padded armchairs, and by night they can sleep in sixteen berths. Forward of the passenger compartments is the poop where two pilots sit. Either can control the plane. Back of the passengers is the compartment for baggage, mail, and express. Cost of this Fokker *F-32* is $110,000 as described. No individual yet owns one. Fokker Aircraft Corp., however, is prepared to fit this model out for individuals, as a flying home or office. The first of these transports was flown around New York early this year. In the last test of the plane the pilot, attempting to take-off on two motors, zoomed it low over some houses on Long Island. It ripped off their roofs and wrecked itself, but with no serious injuries to its passengers. The company immediately built another and sold it to Western Air Express, which with General Motors owns most of the Fokker stock. The Indian head and arrow on the illustration is Western Aircraft's symbol. The Fokker symbol is Anthony H. G. Fokker's last name, written cursively, like Henry Ford's trade-mark.

BELLANCA

GIUSEPPE M. BELLANCA, 44, is a Sicilian so temperamental that he is often termed eccentric. His technical knowledge is sound, his skill versatile. This story of him is true: two engineers of a competive firm went spying to his factory at New Castle, Delaware, where he was preparing to test-fly a new ship. He recognized them, fetched them comfortable chairs, and suavely remarked, "Gentlemen, sit down. Perhaps I can be of some assistance to you. I will bring you the blue prints if you wish, and explain all. And when you have copied this plane, I shall have a new model for your inspection."The first of his planes to win popular fame was the *Columbia* in which Clarence D. Chamberlin and Charles A. Levine flew across the Atlantic three years ago, close after Colonel Lindbergh. The last trans-Atlantic flight, that of Roger Quincy Williams and Lewis A. Yancey, last year, was in his *Pathfinder*. Those were special jobs, built to carry an abnormally huge load of gasoline. The standard plane of his which has become a commercial and private favorite is his *Pacemaker*, depicted here. It is a high-winged monoplane, single-motored, capable of seating six comfortably. Its high speed is 145 m.p.h., its cruising speed 122 m.p.h., its price $14,950. In Canada where many *Pacemakers* are used to transport mail, express, and men to the widely scattered mining properties, the wheels are replaced by pontoons in summer to alight on the ever-present lakes and rivers, by skis in winter for ice and snow landing.

UNIVERSITY LIBRARY OF GEORGIA

BOEING MAIL PLANE

THE chrome yellow biplanes with bright green fuselages which howl every day and night over the 2,000 miles between San Francisco-Oakland and Chicago are what happened when Seattle's William Edward Boeing smashed his plane fifteen years ago. He fixed it so well that he decided that he could build a better plane himself. He hired a one-room factory and thirty men. The money came from his rich lumber and mining properties in the Northwest. His planes were so good the Navy bought them. The contract to carry the mail between San Francisco and Chicago was up for bid. He won it, and designed mail planes to do the work efficiently. Now his employees number more than 1,400. The factory they work in has more than a quarter of a million square feet of floor space. In it Mr. Boeing, genial, bespectacled executive, makes seven kinds of commercial planes, seven kinds of military. His biggest product is a trimotored biplane carrying eighteen persons. A very useful ship is the mail plane, above. The pilot sits in an open but well-sheltered cockpit. His passengers (there is space for four) sit in the heated cabin, as he flies them up to 129 m.p.h. Cost is $22,500. A traveling salesman might well use a variant model of this same mail plane, with only two passenger seats, but with ample space for the storage of his samples.

EARLY in March a grayish amphibion clumped down a dock at College Point, L. I., where Long Island Sound narrows into the East River, and splashed into the water. The plane was a Sikorsky sesquiplane amphibion (Sikorsky spells it thus) similar to the one here shown, except that this one has two 410 h.p. Pratt & Whitney *Wasp* motors, and that one had two 575 h.p. Pratt & Whitney *Hornet* motors. The sesquiplane (wing-and-a-half) is the favorite construction of Igor I. Sikorsky, Orthodox Russian *emigré*, who has established a colony of fellow Orthodox Russians at Stratford, Connecticut, suburb of Bridgeport, where he has his new Sikorsky Aviation Corp. factory. Suspended from the 72-foot upper wing is the hull with seats for eight to ten persons. Attached to each side of the hull are the stubby half wings, each with its float. Pilot of that Sikorsky amphibion which flopped into Long Island Sound was Captain Boris Sergievsky, *emigré*. Instead of passengers he carried two long tons of dead weight. He was about to try for an altitude record. He removed his landing wheels to conform with seaplane specifications, started the motors, and climbed to 19,500 feet, a record for a seaplane loaded so heavily. Next day with the same load he raced it around a level course at 132.5 m.p.h. That was slightly better than the standing 130.1 m.p.h. loaded seaplane record, but not enough to win him official kudos. La Federation Aeronautique Internationale requires that a contender surpass a speed record by at least 5 m.p.h. Nonetheless Igor I. Sikorsky was happy. He is fully as temperamental as Giuseppe Bellanca, and will tear up a contract as quickly when disgruntled. "Do you want a plane that will fly you anywhere you will?" says he, in effect, in his pure, Russian-accented English. "Here it is. If you don't like it, . . ." The Sikorsky is primarily a transport. But many wealthy individuals own them.

SIKORSKY AMPHIBION

Rates

If ten cents a mile is obviously too much to charge for passenger transportation, five cents a mile is equally obviously too little. And at this latter rate, some 50 per cent of the mileage flown by commercial planes can now be covered. The drastic slashes inaugurated by T.A.T.-Maddux last January have brought passenger fares to the level of railroad fares and, incidentally, to a level where the transport companies can *never* show profits, no matter how air-minded and *air-bodied* the public may become.

Most spectacular of the cuts, naturally, was the transcontinental rate, which fell from $267.43 to $159.93, or $1.47 less than the best train and Pullman fare. The results of the slash are important. T.A.T. now carries practically full loads and estimates its traffic increase at nearly 600 per cent. Yet while it runs its fourteen-place Fords and eighteen-place Curtiss-Condors, it must lose money though every place is filled. Suppose, with economies in operation, the company's cost (this includes depreciation and insurance, about 60 per cent of a plane's operating cost) can be stabilized at ninety cents a mile, the gross revenues from fourteen passengers cannot exceed seventy cents a mile. T.A.T. flies each mile, therefore, at a loss of at least twenty cents.

This is absurd, is conceded by all the companies to be absurd, and is a good example of the current disorganization of the industry's schedules. Neither the ten-cent rate nor the five-cent rate bears any relation to the value of the time saved to the passenger; neither rate is fixed at that point known as "what the traffic will bear"; and neither rate gives the transport company a fair return. The only thing that can be said for the five-cent rate is that it may, this winter, so accustom the public to the use of the airplane that later they will be content to pay more.

At some point between the two extreme rates must lie the solution, a rate just to the company and reasonable to the passenger. As airplane rate-making has been begun by the trial-and-error method, so we shall see, within the next few years, a constant juggling of rates, now up to seven cents, now down to six cents, until at length a resting place is found, probably near six and a half cents.

One bright spot in the situation is provided by the terms of the Watres Bill now before Congress. In addition to the help this measure promises the mail transport companies, it allows the Postmaster General to give air mail contracts to existing passenger lines, the basic pay for the first hundred pounds being thirty cents a mile. If the space provided is not used for air mail, the Postmaster may use it for first class mail. This is in effect a Government subsidy, and will almost level seventy-cent revenues and dollar costs.

In the case of the mail transport companies, the Watres Bill goes further. Nothing could have been more ridiculous than the contracts which ranged from $3.00 a pound for a line 200 miles long (New York to Boston, Colonial Airways Corp.) to seventy-eight cents a pound for a line 770 miles long (Chicago to Atlanta, Interstate Air Lines). The Government was spending, each year, about $3,000,000 more than was allowed by Congress. And the astonishing inequality of the rates worked hardships on the lines at both ends of the scale. Aviation Corporation knew that its $3.00 rate (on Boston-New York line) would not last and provided no satisfactory basis for permanent figuring; on the other hand, in taking over the Chicago-Atlanta line, it was absurdly underpaid for its work.

Under the new space-mileage basis, rates will spread from thirty cents per mile for a hundred pounds to a dollar per mile for fifteen hundred pounds. An additional sum, up to twenty-five cents a mile, will be given for night flying and flying over hazardous country. This plan is approved by the industry, even by that portion which will receive less than it did on the old poundage basis. It will generally strengthen the mail transport companies, provide them with assured incomes, and introduce an element of stability much needed and long wanting.

Express

So closely has the industry kept one eye on passenger transportation and the other on mail carriage that it has almost ignored a third, and potentially profitable, source of revenue —air express. In the past three years, producers and distributors have shipped 5,844,826 pounds by express, a fraction of the amount available. Although eighty-two cities are air express stops, one must charter a plane to send anything into Philadelphia, Baltimore, Richmond, Atlanta, Mobile, New Orleans, San Antonio, El Paso, San Diego, Spokane, Helena, or Buffalo. Serving only a narrow band across the continent, the transport companies avoid northern New England, the entire far Southwest, the entire South, and the entire Northwest.

The trouble has not been with the Railway Express Agency, which is more than anxious to coöperate. Its president, Mr. Robert E. M. Cowie, made practical suggestions to the aviation companies: "What we need is planes in regular service with the ability to carry a pay load of at least five tons. When our air lines are equipped with such units, commercial aviation will follow the course of every other transportation system, that is to say, the profits from low volume emergency traffic . . . will shrink into insignificance in comparison with those to be obtained from *the regular and constantly increasing flow of routine business. We must stop marveling at the little romance of stunt commerce.*"

Thus the advice of a railroader. The aviation companies could only answer that they had no planes with five-ton pay loads, and for the present had no money with which to build them. Again it was a question of equipment, and again the industry had to admit it was disorganized. After the 32-passenger Fokker, which could be modified as an express carrier to have approximately 8,000 pounds (four tons) pay load, the largest planes could offer only 3,870 pounds (Boeing), 3,775 pounds (Ford), and 3,430 pounds (Keystone-Loening).

Again the first step seemed to lead the aviation companies toward the railroads. Better than any group in the world, railroaders know how to discover traffic and to accommodate it.

Equipment

To return to the financial equation. One answer to the problem of meeting the dollar-a-mile operation cost is to raise rates; another is to carry more passengers. Fokker has just put into service the greatest passenger plane yet built in this country, seating thirty-two and sleeping sixteen. Even if the passenger rate remains at five cents, this ship, full, will bring in revenues of $1.60 a mile. The Fokker is quoted at $110,000 and depreciation charges (per mile) must be considerably higher than in the case of a Fokker tri-motored transport costing $67,500. Where increased size (and hence increased traffic) ceases to be an advantage is a problem for keen and experienced engineers. The tri-motored plane consumes more fuel than the single-motored plane, and not all engineers are agreed that it is safer. Each transport company must figure its cost-per-mile down to a minimum, and in that figuring, the choice of equipment is vital.

Until now, manufacturers have built more upon the

Four Major Aviation Groups

AVIATION CORP.

Air Line Subsidiaries controlled through newly formed American Airways, Inc. (Partial list):

COLONIAL AIRWAYS CORP.—(Colonial Air Transport, New York-Boston; Colonial Western Airways, Albany-Cleveland, Buffalo-Toronto; Canadian Colonial Airways, New York-Montreal; Colonial Flying Service)

CUBAN AVIATION CORP.—(Servicio Cubano de Aviacion)

EMBRY-RIDDLE AVIATION CORP.—(Embry-Riddle Co., Chicago-Cincinnati)

INTERSTATE AIRLINES—(Chicago-Atlanta, St. Louis-Evansville)

SOUTHERN AIR TRANSPORT—(Gulf Air Lines, Atlanta-New Orleans-Houston; Texas Air Transport, Dallas-Galveston and Dallas-Brownsville; T.A.T. Flying Service, Dallas-El Paso, Dallas-Brownsville, and Dallas-Houston; T.A.T. Flying School; Southern Aeromotive Service; Dixie Motor Coach Corp.)

UNIVERSAL AVIATION CORP.—(Robertson Aircraft Corp., Chicago-St. Louis and St. Louis-Kansas City-Omaha; Continental Air Lines, Cleveland-Louisville; Northern Air Lines, Cleveland-Chicago-Kansas City-Garden City; Braniff Air Lines, Tulsa-Oklahoma City-Dallas; Central Airlines Co., Kansas City-Wichita and Wichita-Tulsa; Robertson Flying Service; Mid-Plane Sales & Transit Co.; Egyptian Airways Co.)

* * *

FAIRCHILD AVIATION CORP.—(Fairchild Airplane Mfg. Corp.; Kreider-Reisner Aircraft Co.; Fairchild Aerial Camera Corp.; Fairchild Aerial Survey; Fairchild Aircraft; Fairchild Engine Corp.)

AVIATION SHARES CORP.—(Aviation Patent & Research Corp.; New York Aviation Corp.)

ROOSEVELT FIELD, INC.

CURTISS-WRIGHT CORP.

Subsidiaries (Partial list):

CURTISS AEROPLANE & MOTOR CO.
CURTISS AEROPLANE EXPORT CORP.
CURTISS-ROBERTSON AIRPLANE MFG. CO.
CURTISS AIRPORTS CORP.
WRIGHT AERONAUTICAL CORP.
MOTH AIRCRAFT CORP.
TRAVEL AIR CO.
CURTISS-WRIGHT FLYING SERVICE
CURTISS-CAPRONI CORP.
REED PROPELLER COMPANY
KEYSTONE-LOENING AERONAUTICAL CORP.
NEW YORK AIR TERMINALS
NEW YORK AND SUBURBAN AIRLINES

Affiliates:

CURTISS REID AIRCRAFT CO.
CURTISS ASSETS CORP.
AVIATION EXPLORATION
COMPANIA NACIONAL CUBANA DE AVIACION CURTISS
AVIATION CREDIT CORPORATION
AVIATION CORP. OF CALIFORNIA
NORTH AMERICAN AVIATION—(Eastern Air Transport Inc.; Miami-New York mail route; Sperry Gyroscope Co.; Ford Instrument Company)
NATIONAL AVIATION CORP.—(Aeronautical Industries, Inc.)
TRANSCONTINENTAL AIR TRANSPORT-MADDUX (across continent by air and rail; Los Angeles-San Francisco, Los Angeles-Phoenix, and Southern California)
NATIONAL AIR TRANSPORT—(Dallas-Chicago and Chicago-New York)

UNITED AIRCRAFT & TRANSPORT CORP.

Subsidiaries:

PRATT & WHITNEY AIRCRAFT CORP.
BOEING AIRPLANE CO.
BOEING AIR TRANSPORT
PACIFIC AIR TRANSPORT
CHANCE VOUGHT CORP.
STANDARD STEEL PROPELLER CORP.
STEARMAN AIRCRAFT CO.
SIKORSKY AVIATION CORP.
STOUT AIR SERVICES
NORTHROP AIRCRAFT CORP.
UNITED AIRCRAFT EXPORTS.

DETROIT AIRCRAFT CORP.

Subsidiaries:

AIRCRAFT DEVELOPMENT CORP.
RYAN AIRCRAFT CORP.
AIRCRAFT PARTS CO.
GROSSE ILE AIRPORT
MARINE AIRCRAFT CORP.
BLACKBURN AIRCRAFT CORP.
EASTMAN AIRCRAFT CO.
LOCKHEED AIRCRAFT CO.
PARKS AIR COLLEGE
GLIDERS, INC.
DETROIT AIRCRAFT EXPORT CORP.

A supplementary list is printed on page 144.

strength of inspiration than with a clear eye to the industry's needs. Planes which are not safe to fly have been put on the market, have made their contribution to the record of crashes. This is more true of the small companies than of established and well-backed companies. A distinct exception is the Curtiss Aeroplane & Motor Company, Inc., which now has two hundred engineers on its pay roll and which is pressing, not so much toward current earnings, as toward an investment (in the form of new designs) which will pay returns four or five years hence.

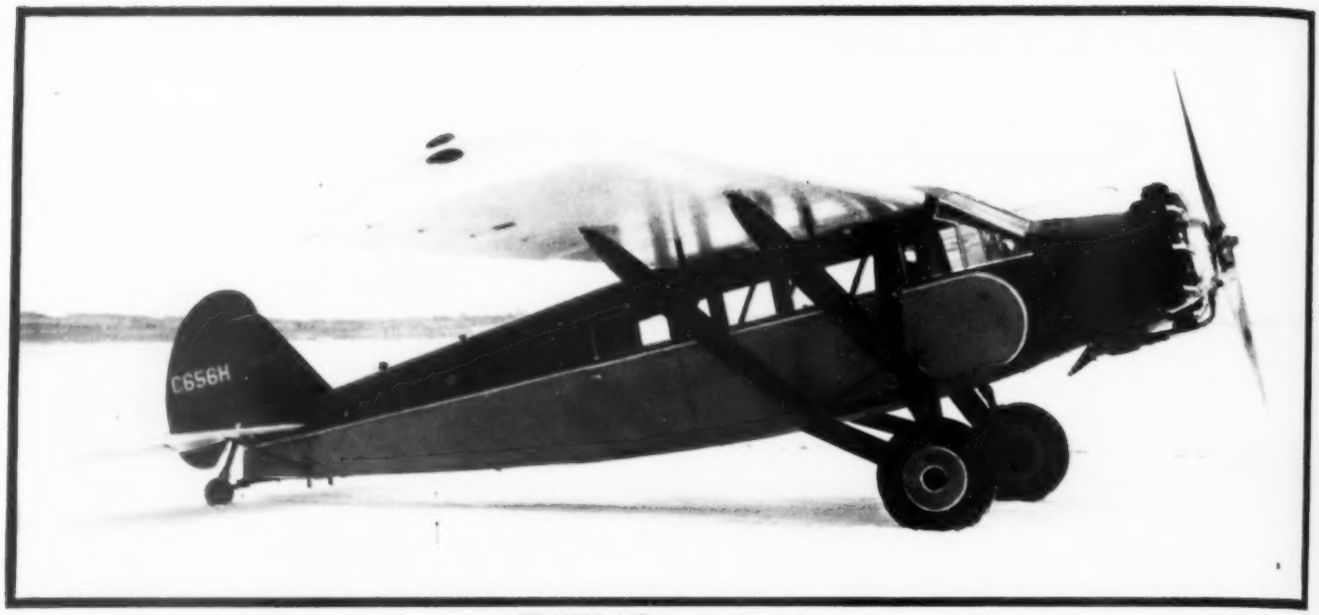
From Curtiss, too, has come another contribution to the equipment problem, this time in relation to safety. While all aviation publicity men make much of the thought that *it is not more safety which is needed, but public acceptance of existing safety,* yet aviation engineers admit that there is much to be done in technical design. So vital did the Guggenheim Fund think this technical work that it offered a prize of $100,000 for the plane which showed the greatest advance in adoption of safety devices. The Curtiss *Tanager* won the competition, with somewhat too much ease. And the engineers who planned it are now studying how to apply its principles (floating ailerons, wing slots, flaps, etc.) to planes built for commercial safety.

The Railroads

When Mr. John Maddux became president, last January, of T.A.T., the new régime was inaugurated by the dismissal of half a dozen high subordinates and their replacement by operating men from the Pennsylvania Railroad. The significance of this move escaped no director of his company and no railroader. It suggested that not only might aviation turn to the railroads for counsel, but that by a gradual process of acquisition and substitution the country's airplane service might become an integral part of the railroads. Blunt Daniel M. Sheaffer, then Pennsylvania's able vice president in charge of traffic, had foreshadowed the upheaval with a pregnant forecast for 1930. "Pennsylvania management," observed Mr. Sheaffer, "is keenly enthusiastic on the future of commercial aviation. Foundations have now been laid, and 1930 should be a year of substantial progress and traffic building. Great distances between boundaries of the United States . . . assure broad market for *well-planned and competently managed flying service. It will continue to develop as it has been initiated; primarily as auxiliary and supplementary service to that of the railroads.*"

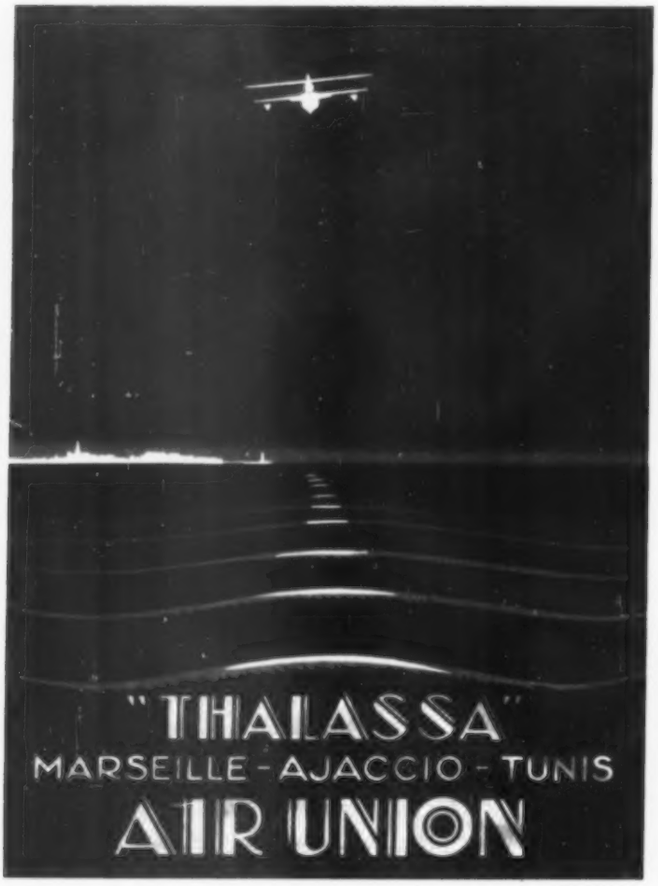
This picture, however reassuring for the companies which have been losing money, is scarcely recognizable as the picture of 1927 or even of 1928. In place of a goggle-eyed, enthusiastic World-in-the-Air, we have a carefully selected portion of the world, using the air for a restricted and computed part of the time. The particular portion and the allotted time being under the control of another form of transport.

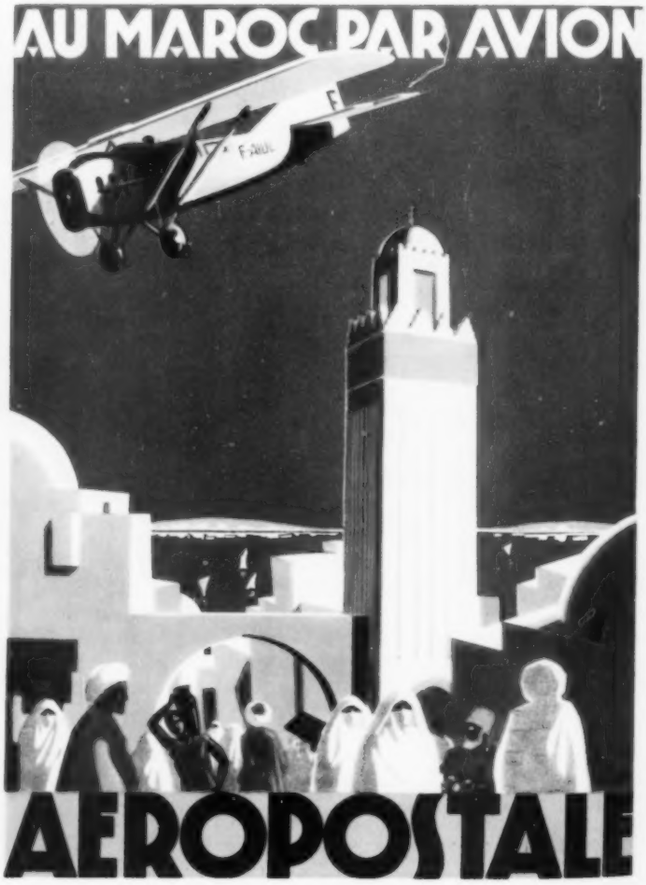
Such a complete recasting of the future of aviation is probably too radical for the industry to embrace. While the arms of the railroads offer what seems like warmth and safety, the price of entering them is too heavy to be paid all at once. Too many men must lose their jobs and their reputations; too many planes must be scrapped. Yet if the Pennsylvania succeeds with its rebuilding of T.A.T.-Maddux, if the New York Central makes Universal into a useful and integral part of its mighty system, if one or two others take over ailing lines and restore their health, a great impetus and a continuing temptation will face the industry. If aviation cannot make itself transport, why should the railroads not try? Profits and peace are, in the long run, more satisfying than the elusive World-in-the-Air.



TRAVEL AIR *(see opposite page)*

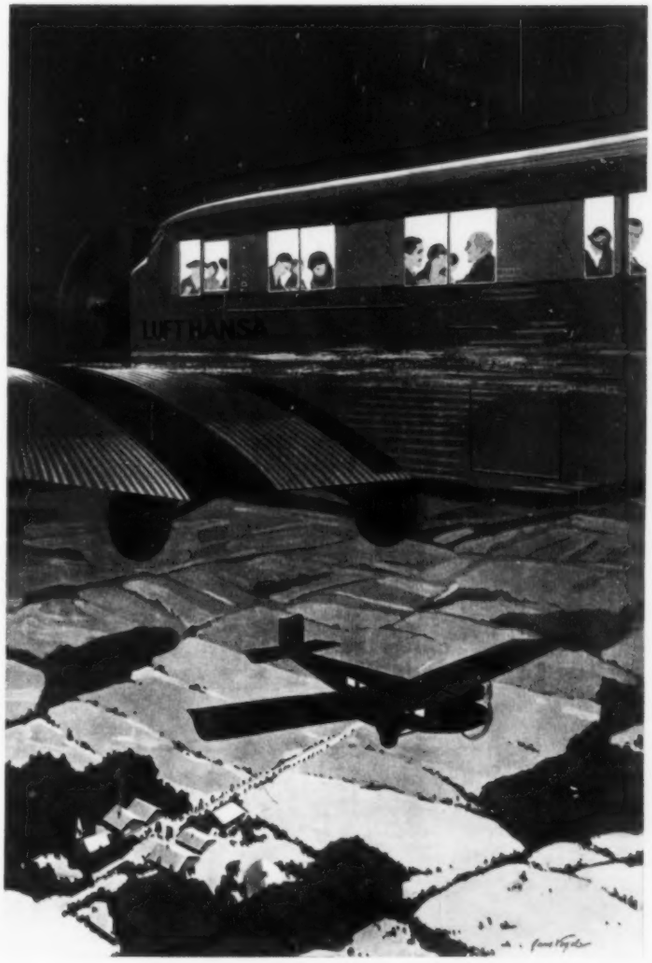
AMONG THE STIMULI WHICH THE U. S. AVIATION INDUSTRY DOES NOT USE TO ENCOURAGE TRAFFIC ARE SUCH VIGOROUS AND COLORFUL POSTERS AS THOSE REPRODUCED BELOW. THE POSTER IS A FAMILIAR EUROPEAN ACCOMPANIMENT OF TRAVEL, BOTH BY RAIL AND BY AIR. HIGHLY EFFECTIVE ABROAD, THIS ADVERTISING DEVICE MIGHT WELL BE ADOPTED HERE.





LOCKHEED *SIRIUS*

THE two blobs in the cockpits of the thoroughly streamlined, low-wing Lockheed *Sirius* monoplane above are the heads of the most idolized persons in aviation, Colonel and Mrs. Charles Augustus Lindbergh. Colonel Lindbergh gave his $17,825 check for it, and then proceeded to test out its air-worthiness for the Lockheed Aircraft Corp., a subsidiary of Detroit Aircraft Corp. The Shell Aviation Corp. bought the second, to be flown by Captain John P. McCready of the western division. More generally useful Lockheeds are the *Vegas*, particularly the five- and seven-place cabin ships. They are the fastest commercial ships. William Gibbs McAdoo, President Woodrow Wilson's Secretary of the Treasury, owns one. When skipping across the country with it, he likes to have his pilot take it to its highest possible altitude and then zoom it swiftly down. At Kansas City, Dr. Walter M. Cross, consulting chemist, uses his Lockheed *Vega* for swift business trips. Captain Sir Hubert Wilkins used two Lockheed *Vegas* to explore in cold Antarctica two winters ago. When his season ended, he stored the planes in an iron-sheathed hangar which was soon snowed over. They were in good condition when he returned for further exploring last autumn. Perhaps the best known Lockheed *Vega* is that one owned by the Texas Corp. in which Captain Frank Hawks set his transcontinental record.



AT THE Cleveland Air Races last autumn a single-seater, low-winged, black-mounted monoplane, similar to but smaller than the Lockheed *Sirius*, whizzed around the course to win, at 194 m.p.h. It was the Travel Air Co.'s *Mystery S*, which can attain 240 m.p.h. when pressed. In 1922, when Travel Air's President Walter H. Beech was working for the Swallow Airplane Co. at Wichita, Kansas, he won the national efficiency race. Two years later he formed the Travel Air Co. with four other young men. Two of them, Clyde V. Cessna and Lloyd Stearman, now head their own companies, producing, like Travel Air, light planes for sport and business. The Travel Air Co. is closely affiliated with the Curtiss-Wright Co., so closely that it has been announced that Mr. Beech will be president of the Curtiss-Wright Sales Co., which markets the planes made by the manufacturing companies controlled by the main corporation. The plane which he is pushing hardest for his own company is the neat one shown on the opposite page. It has six seats including two for pilots. Hence transport companies use it to fill in the gaps between cities off their main lines (feeder services). Business men, for example President S. D. Black of the Black & Decker Mfg. Co. (fine tools), use Travel Airs to carry their high executives around sales territories, or have the ships fitted as offices for work en route. The price of this plane, $13,005, is low enough to attract a large number of individual owners.

Bottled Time

The economic importance of Elgin's Mr. Urie, right or wrong.

TO THE watchmaker, time is a commodity extracted from the universe and bottled for domestic needs. The process consists of the mining of the raw material and the preparation of the containers. At Elgin the preparation of the containers requires 4,000 men, 68,000 machines and attachments, 7,000 kinds of bench tools, 211 parts, 3,773 operations, and nine months to a year and a half. The mining of the raw material requires one man, one transit, one push button, one revolving graph, and a few minutes a day. It is a matter-of-fact, straightforward, businesslike industry.

The only oddity about it is the fact that the commodity it so carefully extracts from the stars is almost certainly not there at all. Einstein plus Minkowski plus Eddington are convinced of that, adding, however, that its extraction and bottling are an essential trade to be by every means encouraged. Mr. Urie, astronomer of the Elgin National Watch Company, naturally holds a different opinion. He has seen it. To be exact he has seen it for years, two clear nights out of three, from the slit in the roof of his observatory on the hill above the company's works. And he has not only seen it; he has removed it from the night sky and piped it to the factory to be put up in brass.

Mr. Urie is undoubtedly misled. He is like the fisherman who scooped his shadow from the sea. He is a harvester of illusion. And it is altogether immaterial whether he is right or wrong, because the stuff he gathers is the prime necessity of our age. Without it, even granting that it is not there, communication over any distance, transportation of almost any kind, machine production to any considerable extent, complicated social relations and business transactions, the modern practice of medicine, and almost all forms of scientific experiment would be precisely impossible. As Minkowski would be the first to admit. For life, by the Proper-Time of the new physics, would be obliged to balance the advantage of theoretical perfection against the incredible inconvenience of never knowing when it was dinner time relatively to the cook.

Mr. Urie's respectability

Mr. Urie therefore remains a respectable and important person in spite of the doubtless visionary nature of his activities. But even so he is a curious figure. He stands at the eyepiece of his transit watching a grill of eleven spidery lines against the void meridian. A speck of light swings past—Polaris or some unnamed, intricately numbered star. The pressure of his finger on a button jogs the ink line of a turning graph. The graph is geared to a Riefler clock which, below him, upon a concrete pillar separate from the building itself, in a hermetically sealed glass jar, at a constant pressure and a constant temperature, records sidereal time. Each of the paralleled lines drawn by the recording pen upon the graph is one minute long. Each minute's length is scored sidewise in seconds. Seconds, on Mr. Urie's map, are half an inch in length. As his finger, obedient to the sliding star, presses the electric button, the line of the recording pen wavers. It wavers again as the star crosses the next of the eleven marks and the third and the fourth and so on to the last. The average of the eleven marks is the point upon the clock's track at which the meridian of Elgin met the star observed. Mr. Urie turns to a volume entitled *The American Ephemeris and Nautical Almanac*. There the time at which the meridian of Elgin *actually* (i.e., astronomically) met the star in question is written down. The difference between that time and the time mark on the graph is the clock correction.

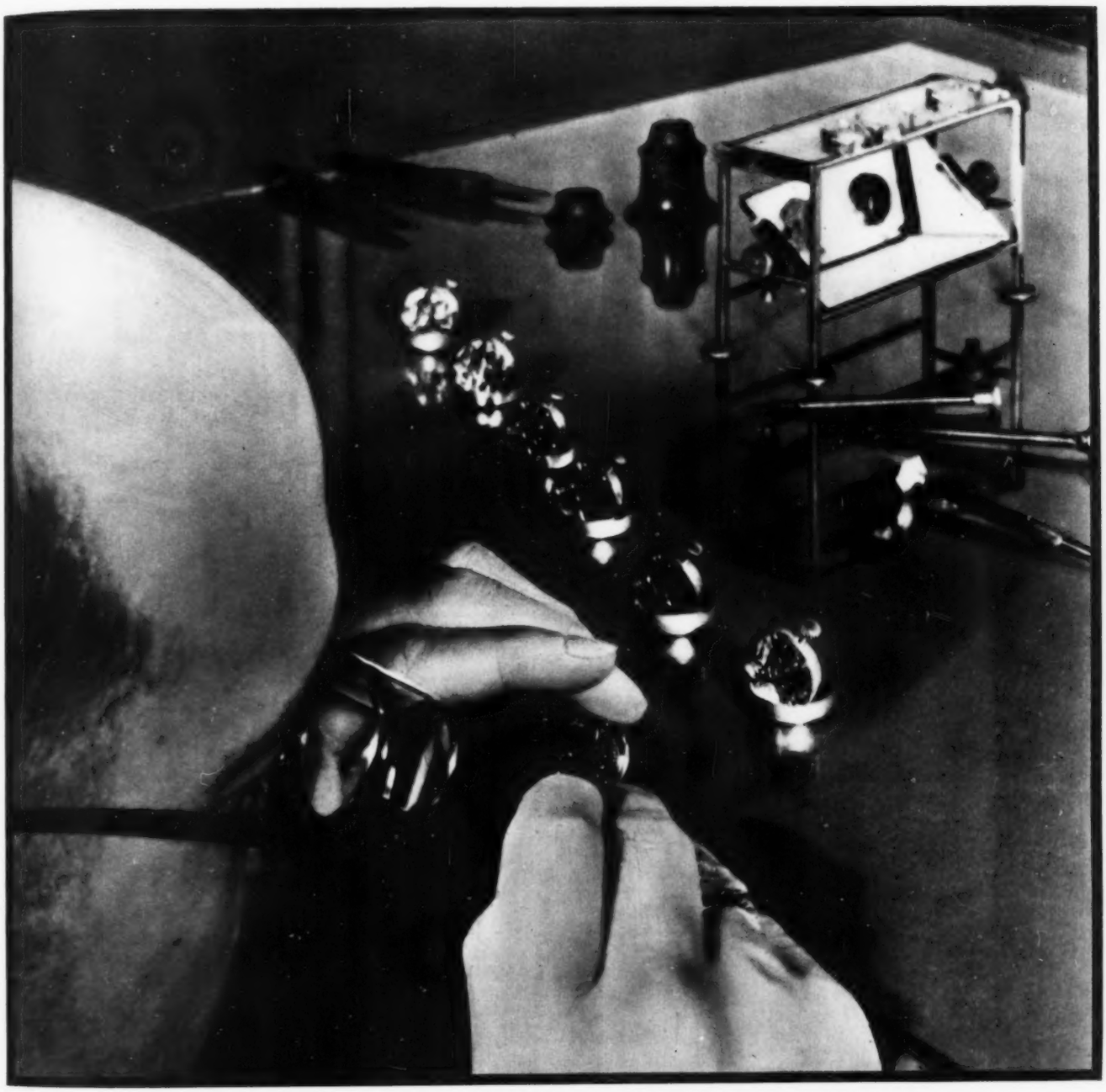
The moment Now

So, on a clear night, he watches the meridian past a dozen stars. From jog to jog of his push button the earth rolls over to the sky. This rolling of the earth is Mr. Urie's time. It is a kind of dead reckoning in which not the log chip at the line's end but the chip itself whirls round to count the miles. Like all dead reckoning, it shows no more than where we are in relation to what's behind us and what may be on ahead. From where to where is no concern of Mr. Urie's. His occupation is to find the moment Now.

But the moment Now upon the dial of the sidereal clock is a strange moment. Only once in the course of a year will it coincide with the Now we know. Dawn may fall at sunset by that clock and three in the morning happen in the afternoon. Sidereal time laps over sun time by one day in the year, for the earth, rotating on its axis as against the stars, wheels also once a year around the sun, compensating by that movement one rotation.

To make this raw time available in a world long accustomed to working by sunlight and sleeping by dark, it must obviously be stepped down to solar dimensions. But true solar time is impossible to a clock, for the true solar day contracts and expands during the year. Mr. Urie (and some hundreds of millions of his contemporaries) accordingly assumes an arbitrary mean solar day of twenty-four hours, reduces the star time of his sidereal clock to the terms assumed, and transfers it to a second master clock, upon a second column in a second case. This last is finished time. Neither the sun, nor the stars, nor Mr. Einstein recognizes it, but it stripes the earth in bands of fifteen degrees and variations of an hour from Greenwich round to Greenwich. It permits all the interlocking movements of civilization. And the horologists manufacture it out of points of light and mathematics. For a needy world.

At Elgin it is carried directly by wire to the factory at the bottom of the hill. There the hum of the adjusting rooms is tripped at abrupt and regular intervals by the click of a telegraphic key. The workmen at the chin-high jewelers' tables change the positions of the microscopic golden screws that weight the balance wheel. The brass-cogged movement turns more slowly, faster, till it catches the precise insistent beat. The watch moves with the electric signal, with the mean clock, the sidereal clock, the earth. And time is bottled.



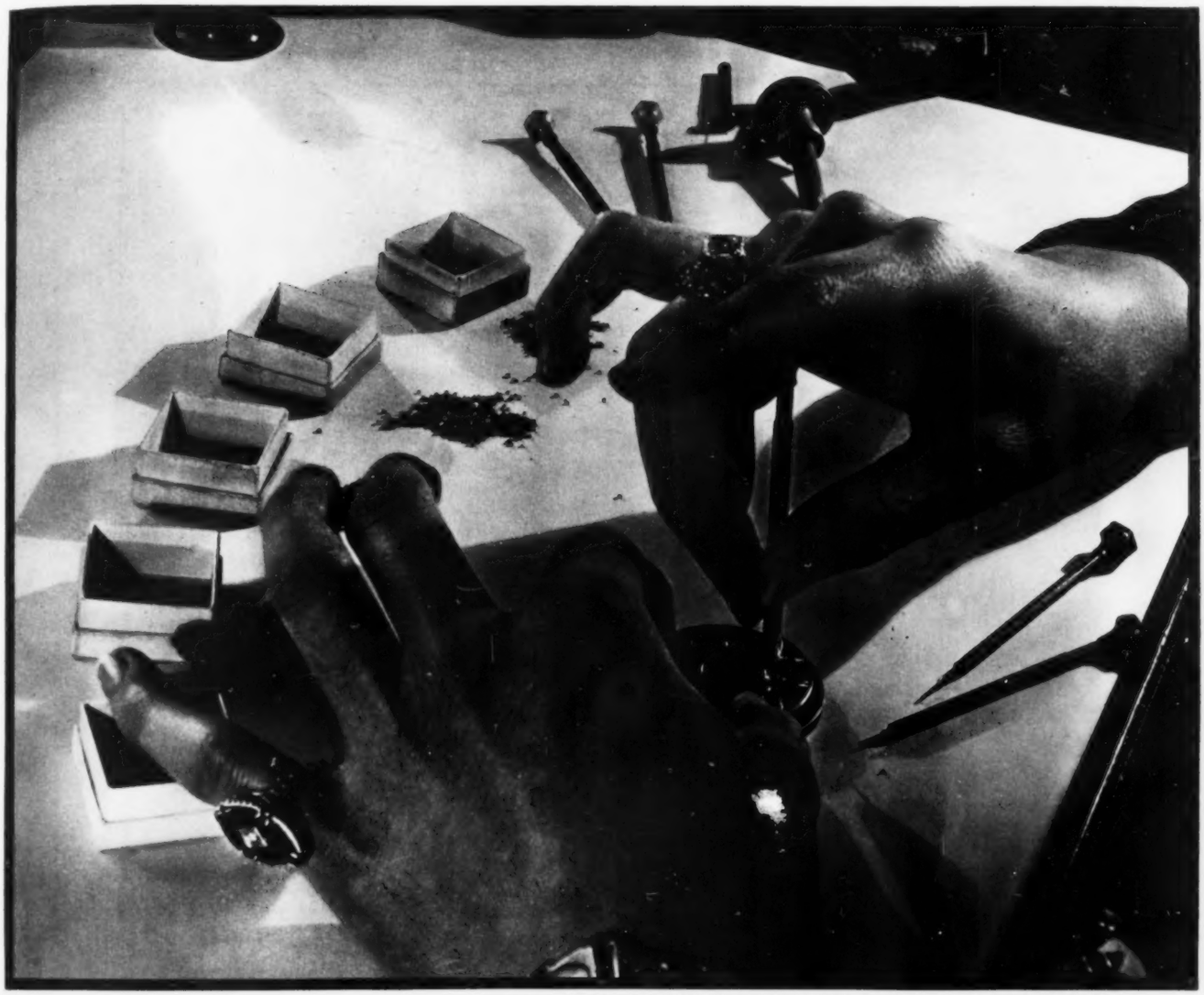
ONE OF A SERIES OF STUDIES IN SCALE, TAKEN AT ELGIN BY MARGARET BOURKE-WHITE

BENEATH fifteen pairs of such hands the Elgin timepieces pass in unbroken line. This finisher and his fourteen colleagues are watchmakers of the old days. Each must be expert in every detail of the work, must be able to take the watch apart and rebuild it, must not retard the delivery of the completed, adjusted instrument at the end of its nine months to one year period of manufacture. At the peak of production they complete 4,000 timepieces a day, more than the combined production of all other American watch manufacturers. In 1929 the sale of these units netted Elgin National Watch Company about $2,000,000.

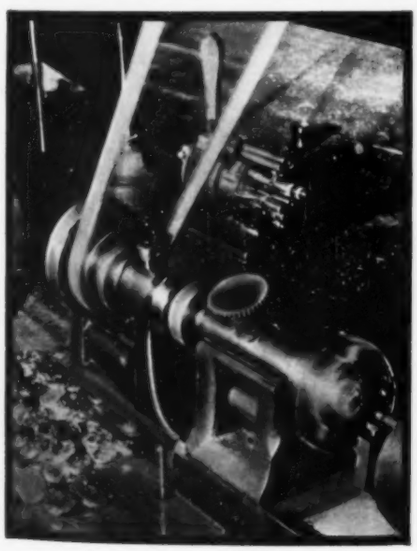
In the factories of Elgin, Hamilton, Waltham, the finishers turn out 2,000,000 watches, more or less, each year. In the record year 1925, it was more, with domestic production of timepieces valued at $82,000,000, Swiss production at $59,000,000, German at $25,000,000. Since then, it has been rather less, foreign competition becoming keener. America remains, however, not only the largest producer of timepieces in the world, but by far the largest buyer. In addition to absorbing 95 per cent of its own manufactures, it buys more foreign-made watches than any other nation.

Like the sun's shadow itself, man's first chronometer, the tide of watches moves across land and water from east to west: German watches to England, Swiss watches to America, American watches to Canada and Australia, Japanese watches to China, the flow constantly regulated by human mechanisms scarcely less delicate or less precise than the intricate mechanisms they produce.

NOT THE LEAST DELICATE OF OPERATIONS AT ELGIN IS THE FLECKING OF WATCH HANDS WITH LUMINOUS ENAMEL PAINT



ELGIN'S COMPETITION IN PRECISION—WHIRRING DRILL V. HUMAN HANDS



THE development of the watch in the industrial age is purely a development of watchmaking machinery. Elgin, with 4,000 employees, produces 4,000 watches a day, and each watch is approximately a year in process. The price of an adequate timepiece has dropped from the equivalent of hundreds of dollars to a matter of ten or twelve. These are the ordinary effects of machine intervention. The machines themselves are too human to be anything but unique in their kind. They are none of them patented. They are all made at the factories, are trade secrets, and their inventors are as carefully guarded from the accidents of conversation as tribal magicians.

But watchmaking was too old and expert a craft to be taken over and transformed by power-driven tools as most other industries have been taken over, and the manual machines have done nothing to decrease the human importance of the workers. The fingers are still the final judges of the freedom of a turning point and the eyes of the temper of a spring. The more exacting and monotonous the work, the greater is the delicacy and precision of the movements of the hands. The girls who set the hairsprings in the needle eyes of brass, their faces bowed above the magnifying glasses in the low green light, have the serious and quiet look of women sewing. There is no sign that this eight hour concentration upon the dimensions of the microscopic world is painful to them. The only physical evidence of the peculiar nature of their work is the care they give their hands. Most of the girls wear jewels (not watches only) on wrists and fingers, and pay elaborate attention to their hands.

In a motor car selling for $3,000, the factory labor cost may be as low as $180. In a watch retailing at $100 and selling, at the factory, at $50, there will be $42 of factory labor cost. An automobile frame can be, and is, automatically assembled. The watch remains, in spite of the thousands of machines, a human product.

Big Ship

The North Atlantic trade, already over-tonnaged, now awaits more monsters. How they may clear small profits, but how they are essential, is told herein.

THE S.S. *Leviathan* is the biggest passenger ship afloat. She is not the longest ship, for the *Majestic* is eight feet longer. Nor the fastest ship, for the *Bremen* makes the crossing in ten hours less. Nor the newest ship, for the *Europa* made her maiden voyage March nineteenth. But measured by the yardstick of gross tonnage, the *Leviathan* is queen of the seas.

To support royalty is an expensive proposition, as most states will testify, and when a queen travels, the bills are high. A classic example of this was the visit of the Sheban lady to Solomon; a modern example the tour of Marie of Rumania. As Marie sailed from Cherbourg on the *Leviathan*, our analogy comes to a happy point. Before the huge ship left New York on the first lap of her round trip, the fixed, unavoidable expenses of the trip were already enormous. Had she sailed empty from New York, without a single letter, a single piece of freight, had Queen Marie been the only passenger to board her at Cherbourg, the cost would have been only slightly less. Nothing of the kind happened, of course, and the *Leviathan* made two normal crossings which cost the United States Lines about $325,000, brought them in $500,000, and left them with an operating profit for the voyage of over $175,000.

This profit is normal for a big ship on an *average* crossing. It is not normal for the great eastbound (May 14–July 10) or westbound (July 20–Oct. 1) hegiras, when the profit may top $500,000. Nor is it normal for the slack (Jan. 1–March 15) season, when any big ship is lucky to break even. But averaging the *Leviathan's* sixteen yearly round trips, the result approximates $175,000. It piles up close to $3,000,000 over a year's operations. These figures, detailed, appear on the accompanying fiscal chart of the *Leviathan*. They do not make clear the financial status of the United States Lines, which is a complicated subject in itself; no allocation is made to the *Leviathan* of such administrative expenses as advertising, taxes, overhead, etc., nor is the chart adjusted to include the interest on the investment or depreciation, which will be discussed later. The chart details the average operating receipts and expenditures of a big ship. Having spent $20,000,000 to build such a ship, the owner may reasonably expect it to bring in, each year, $3,000,000 more than it costs to operate.

Why the *Leviathan?*

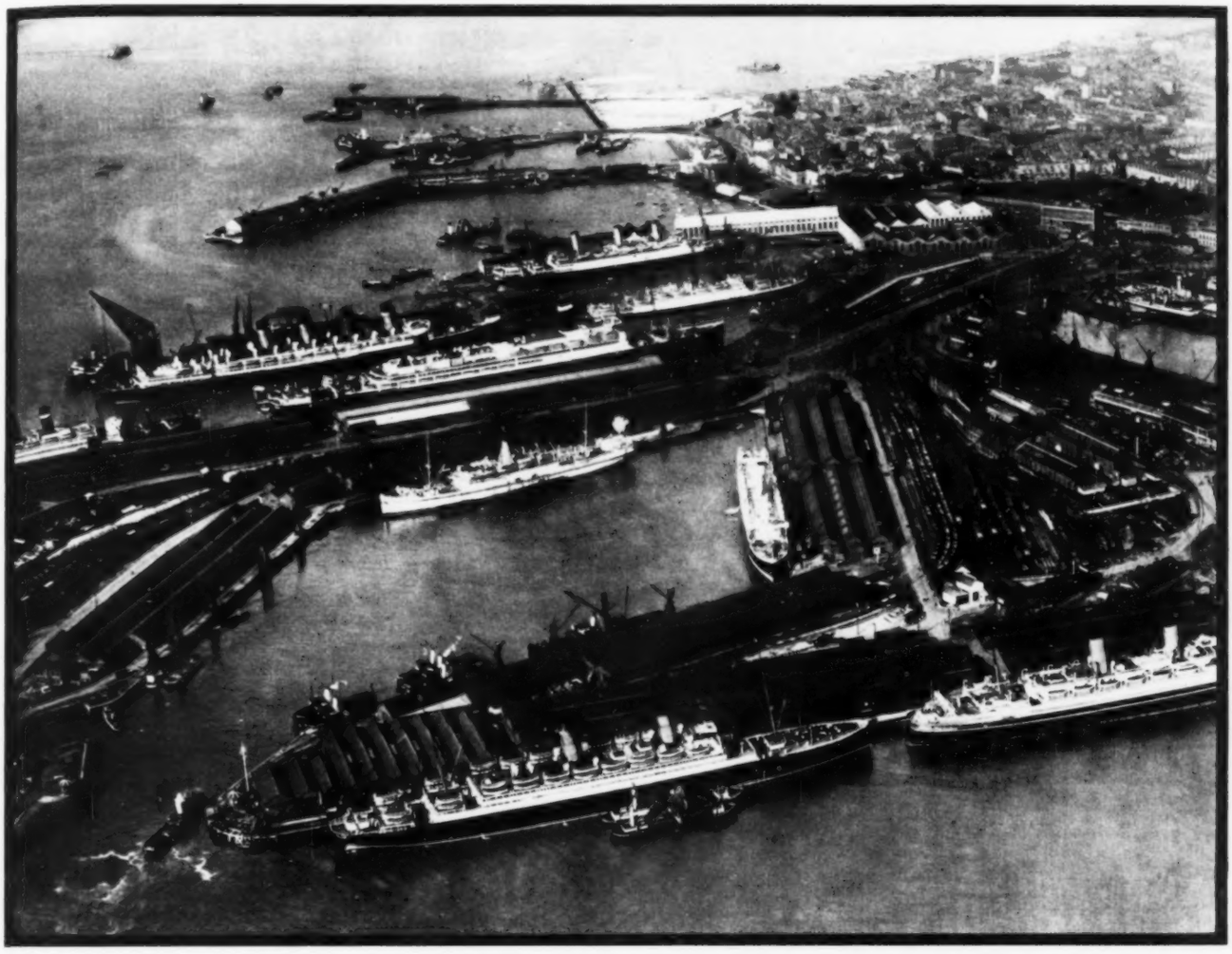
Each year some forty thousand persons climb the gangplanks of the *Leviathan* and prepare to spend five days and six hours upon the Atlantic ocean. Very few of these travelers have any link with the traditional American boy who in the last century ran away to sea. They neither know nor care which way the wind is blowing; faced with an old sextant or a new fathometer, they would be wide-eyed and helpless. They did not board the *Leviathan* because they wanted to go down to the sea in ships. Rather they chose the *Leviathan* because, with good luck, they could pretend they were not on a ship at all, but comfortably and conveniently at home in Chicago, Denver, or Kansas City. Presently, having looked at the stock quotations, attended mass, danced in the night club, watched the movies, played golf and tennis, eaten caviar and fresh asparagus, they would step off at Cherbourg or Southampton and see Europe.

If this brand of seafaring is somewhat less glamorous than the brand of our Yankee ancestors, it is infinitely more comfortable and ordered. The *Leviathan* has appealed to American patronage on many counts, all of them cleverly put forward and all of them twanging the business-as-usual string. "Stewards who talk your own language . . . American food under the American flag . . ." But the most compelling of all is the promise of comfort contained in the phrase, "World's

[*Continued on page 94*]

S. S. LEVIATHAN

REVENUES (*Per voyage*)			
FARES: *First class*	$260,700		
Second class	59,500		
Third and tourist	128,900		
		$449,100	
MAIL (*9,300 sacks*)		43,600	
FREIGHT (*340 tons*)		5,600	
MISCELLANEOUS		14,000	
			$512,300
OPERATING EXPENSES (*Per voyage*)			
WAGES: *Deck department*	$ 5,000		
Stewards department	28,000		
Engineers department	14,000		
Miscellaneous	2,000		
		$ 49,000	
FUEL OIL		85,000	
FOOD: *Passengers*	$ 34,000		
Crew	14,000		
		$ 48,000	
COMMISSIONS AND TAXES:			
Commissions	$ 30,000		
Rail fares	11,000		
Port taxes, etc.	34,000		
		$ 75,000	
MAINTENANCE		38,000	
SHIPS' STORES		17,500	
OTHER CHARGES, (*including insurance, laundry, etc.*)		18,000	
			$330,500
OPERATING PROFIT PER VOYAGE			$181,800
OPERATING PROFIT PER YEAR			$2,908,800



Great Britain Builds $65,000,000 Docks at Southampton

AT SOUTHAMPTON, England, concrete arms, with elbows crooked, year by year welcome such ships as the huge *Leviathan* (shown above in the center of the picture). Now Southampton needs more arms to shelter more *Leviathans*. Therefore each day at Southampton may be seen a fleet of eight ships plowing seaward, towing many a heavy-laden barge. Arrived at its destination, each and every barge surprisingly dumps its burden into the sea. Many times will ships thus jettison their cargo, and when they have finished they will have made, at the bottom of the sea, a gigantic and entirely useless mud pie.

Here, too, spreads a three-mile network of pipes from especially equipped vessels over the mudlands of Southampton's river Test. From their gaping, thirty-inch mouths issues an unending spew of river-bed earth, firmer and more useful than the too soft mud towed out to sea. This mighty ejaculation, heaved from the river, pours upon mudlands, to reclaim four hundred acres to be added to Southampton docks and Southampton town.

Into the river are being lowered seventy-eight 7,875-ton monoliths of concrete. When the last has sunk into its mud bank, Southampton will have a new quay wall for ships, a mile and a half long, capable of berthing eight *Leviathans*, holding back four hundred acres of new land from a new river channel forty-five feet deep.

Thus the $65,000,000 Southampton dock project of the Southern Railway Company of England. In one year, 1,000 feet of quayage will be added to the port's present 21,000. When at length the wall is finished, the sea jetty built, the warehouses, transit sheds, feeding roads, and railroads completed, Southampton will have seven miles of quays to handle passengers and cargoes of 3,500 ships a year. In the engineers' plan of the project (reproduced below), the existing docks are shown at the right.

largest ship . . . her 59,960 tons will make the blue Atlantic behave." And so they will. To the *Leviathan* passenger, the blue Atlantic is a pleasant and interesting background for the day's routined life. It is difficult to remember that there was a time when departing friends were fortified, not with pecan nuts and tangerines, but with the Holy Bible.

Guides to the Atlantic's behavior

Most basic of all the many reasons for this change, of course, is the substitution of oil for wind as motive power, the shift in scene from the rigging to the engine room. This was not accomplished without enormous expense. Wind is free, but it costs the *Leviathan* $85,000 a voyage to keep her forty-six Yarrow boilers fed with their six thousand daily barrels of oil. Below decks on the ship are one-fourth of her crew of one thousand men, varying in importance from the chief engineer through his staff of forty-six trained, licensed engineers to the furnacemen who fit keys into little balls on the furnace doors and turn them until the flame is right, and from the furnacemen down to the lowly wipers. In the ship's social scale, the wiper is the engine room equivalent of the gob who scrubs the decks. He is largely responsible for the high rate of turnover in the engineers' department—about 30 per cent a round trip as against 15 per cent for the more staid, class-conscious stewards. Together with his engine room superiors, he accounts for a pay roll, per voyage, of $14,000 and brings the total cost of driving the *Leviathan* across the ocean and back to about $100,000. This is the blue Atlantic's most important—and most expensive—lesson in behavior.

Thus far the size of the *Leviathan's* bills appears to be unavoidable. Barring the discovery of a cheaper fuel, no amount of economizing will do much good. Above, in the kitchens and the dining room, the situation is different. The cost of rationing a man on a packet was figured, in 1838, at twenty-eight cents a day for a twenty-two-day crossing. Men's appetites have not changed much since then, and their stomachs are no larger. Why, then, the *Leviathan's* astonishing scale of food costs, ranging from the crew's average of eighty cents a day a man to the first class rate of five dollars or six dollars? Why the round trip bill of $48,000?

The physical reason would be quickly apparent to anyone watching the deluge of food which pours into the ship in New York, the smaller deluges of Cherbourg and Southampton. The quantities are gargantuan. Consider these figures, selected at random, per voyage:

FISH	
Codfish	1,870 lbs.
Lobster	822 lbs.
POULTRY AND GAME	
Ducks	1,158 lbs.
Geese	1,525 lbs.
BUTTER	
Passengers	4,100 lbs.
Crew	2,000 lbs.
ICE CREAM	
Assorted	2,000 qts.
French vanilla	570 qts.
Biscuit tortoni	120 qts.
Chocolate	160 qts.
Strawberry	60 qts.
Nesselrode	90 qts.
Tutti-frutti	40 qts.
Raspberry	40 qts.
Pistachio	40 qts.
Coffee	50 qts.
TOTAL	3,170 qts.
NUTS	
Almonds	335 lbs.
Brazil nuts	38 lbs.
Pecans	88 lbs.
MEATS	
Beef	17,000 lbs.
Ham and bacon	8,000 lbs.
VEGETABLES	
Potatoes	40,000 lbs.
Cabbage	3,500 lbs.
Lettuce	3,600 lbs.
Artichokes	900 lbs.
FRUITS	
Oranges	12,000 lbs.
Grapefruit	7,000 lbs.
MISCELLANEOUS	
Coffee	3,623 lbs.
Gherkins, sour	12 bottles
Gherkins, sweet	20 bottles
Nabiscos	100 lbs.
Raspberry jam	60 tins
Pork sausage	1,100 lbs.
Sardines	500 tins

Already the answer begins to be clear. Not only did no packet ever stock 5,642,000 pounds of food a year, but there was no equivalent on its menu for *ten different kinds* of ice cream. And no packet ever carried such fabulous delicacies as caviar (175 pounds @ $7.50 per pound); frogs' legs (60 dozen); calves' brains (60 pounds); quail (25 dozen @ $5.00); woodcock (40 pair @ $2.50); grouse (70 pair @ $2.00); pheasants (55 pair @ $1.95); partridges (97 pair @ $1.35). Or such beguiling things as rose petals (1 box); crystallized violets (4 boxes); orange blossom leaves (1 box); *dragées* (1 pound); gum tragacanth (2 pounds). Or eels (50 pounds); ginger-snaps (60 pounds); pâté de foie gras (25 packages, 34 tins).

Here, obviously, is catering on an amazing scale. The *Leviathan's* passengers are not merely being nourished on their crossing; they are being teased, pampered, and gorged. Theoretically, this figure of $48,000 could be slashed in half—cut down by three-fourths. Practically—and the operating chiefs of all the lines admit this regretfully—it can scarcely be slashed at all.

For such lavish providing is part of the business-as-usual program. If Queen Marie (or such equally noted *Leviathan* passengers as Mr. Owen D. Young, Ambassador Dawes, Chief Justice Hughes, General Pershing) should suddenly have an uncontrollable desire for an eel *en gelée*, it is the *Leviathan's* particular pride to be able to supply it. Hence the fifty pounds. Often they are not ordered, and as one cannot compel even a wiper to eat an eel against his will, they make up a part of the ship's constant, distressing, and inevitable waste. But the eels, too, play some subtle rôle in the business of making the blue Atlantic behave.

Cooks and stewards total five hundred in the slack season, seven hundred and fifty at the peak. Theirs is the lion's share of the pay roll, some $28,000 each trip. If this figure is added to the $48,000 food bill and such minor items as $4,000 for laundry, one can arrive at the cost of providing *Leviathan* passengers with bed and board. It adds up to $85,000 or $90,000 and brings the ship's bills close to $200,000.

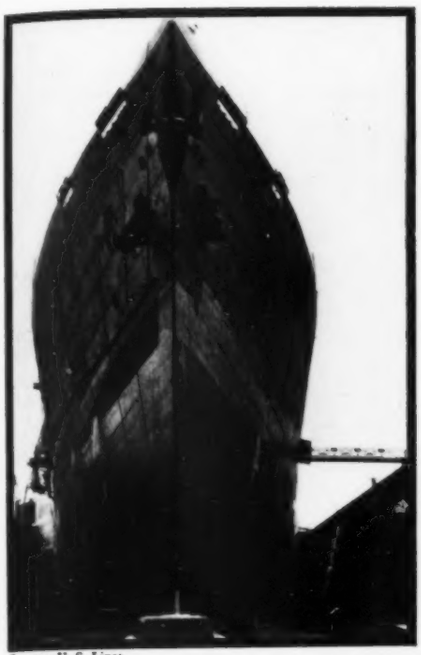
From this point on, costs are less easily classifiable and much less easily analyzed. Under "commissions and taxes" are detailed the agents' commissions, the various taxes fixed at foreign ports. (French invalids benefit by one hundred francs from each *de luxe* passenger who touches at Cherbourg, fifty francs from first class, thirty from second class, twenty from tourist class, and twelve from third class.) The maintenance charge of $38,000 a trip is a rough allocation over the year of the large expenses of dry-docking and general repair. In the ship's stores at $17,500 is included breakage, which is large, and theft. Expenses of the deck department are largely applicable to the ship's luxury budget, its games and its diversions. These are not enormous and, like the eels, they are necessary to the scheme of things of the modern big ship. If the scheme of things is good, then eels and the new Club Leviathan are wise.

The monster ship

When an English (or French or German) line plans a new ship, it is theoretically free to decide upon any size it pleases. An American ship, designed to be useful in wartime and hence able to pass through the Panama Canal, cannot have a beam (width) of more than 108 feet. As the public demands larger and larger ships, this at first appears to be a handicap, present or potential, which the American lines must face. Actually, the size of a ship is limited by many factors other than laws and naval conferences, most notably by the harbors it must enter. While England remakes Southampton (see page 93) and France remakes the harbor of Le Havre, no harbor is planned to allow the maneuvering of a ship of, say, half a mile in length. Thus many shipping men think the present big ships, about one thousand feet long, have reached the practical limits of size.

This is extremely important, as it bears upon the most capricious of the big ship's problems—the problem of obsolescence. When a ship in the North Atlantic trade is popularly out-of-date, it immediately becomes a total liability. It is far too big to be used in any other service, and without a good passenger list, it can be operated only at a tremendous loss. Thus each line strives to rejuvenate its monsters by every operation it can perform. Curiously enough, a ship's obsolescence is governed not so much by its physical condition (the life of a good hull is indefinite) as by its social status. The *Leviathan*, which is a pre-War ship, can plausibly date its physical life from its stripping and reconditioning in 1923. But its social youth needs such occasional hypodermics as the new night club, the talking movies, the ship-to-shore telephone. All lines were conscious of this need in 1926, when the modernistic *Ile de France* took the public's fancy, and distressingly conscious in 1929, when the *Bremen* sailed from New York with

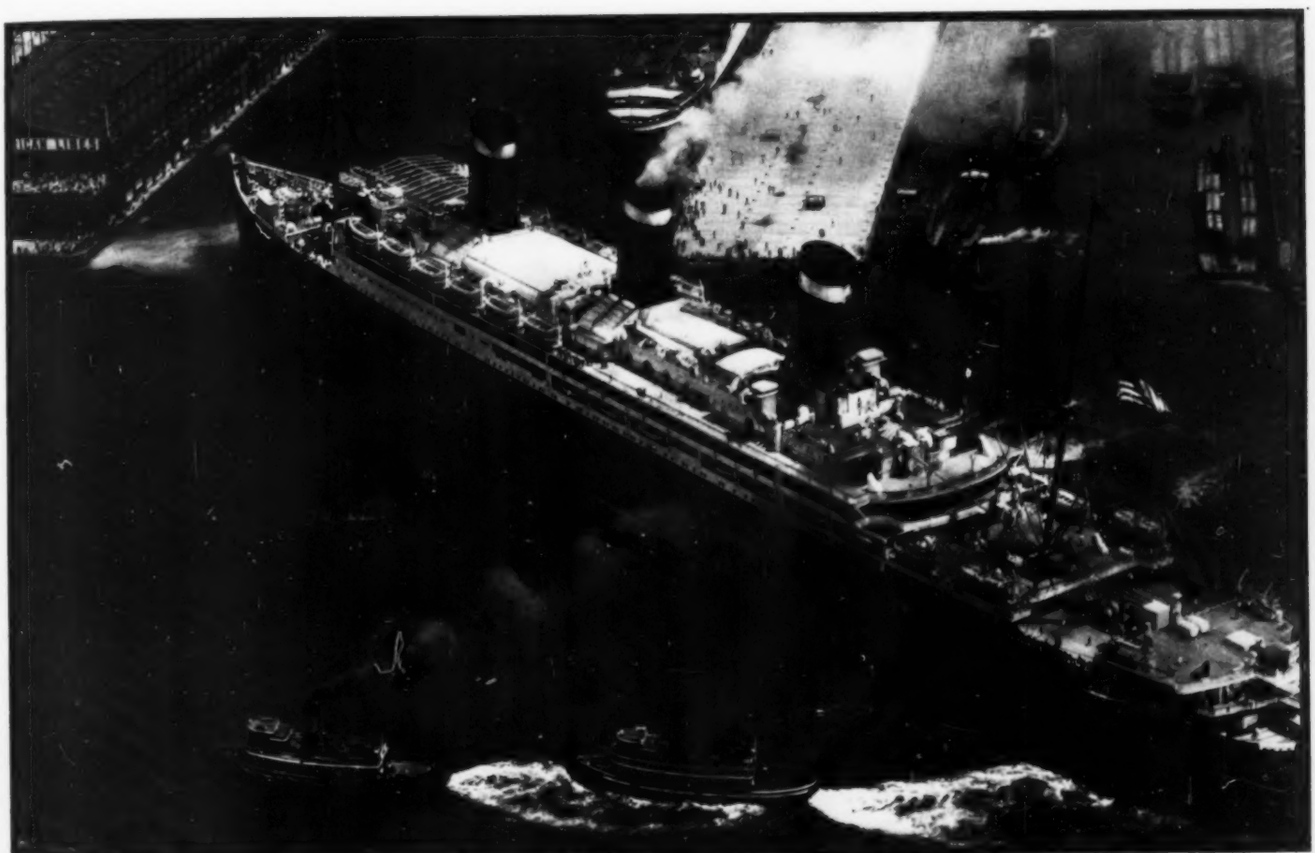
[*Continued on page 130*]



Courtesy U. S. Lines

Fairchild Aerial Surveys, Inc.

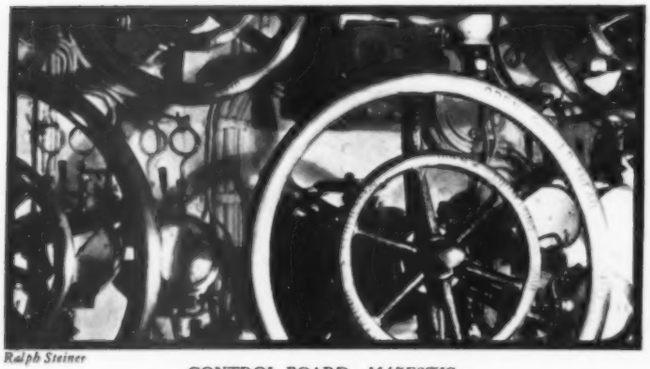
BOW AND STERN OF THE *LEVIATHAN*—THE BOW FROM HER DRY DOCK IN BOSTON, THE STERN FROM AN AIRPLANE FLYING ABOVE THE HUDSON RIVER



Fairchild Aerial Surveys, Inc.

THE *LEVIATHAN*, DOCKING, SHOWS 1,000 FEET TO BE NEAR THE PRACTICAL LIMIT OF LENGTH

Few Passengers See These Corners of the Modern Big Ship



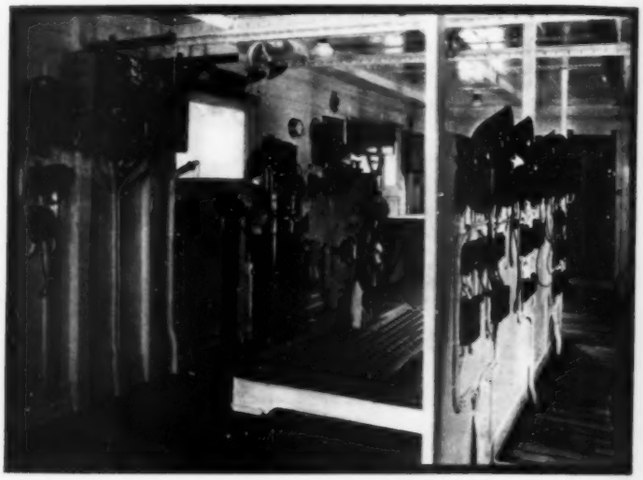
Ralph Steiner

CONTROL BOARD—*MAJESTIC*

Ralph Steiner

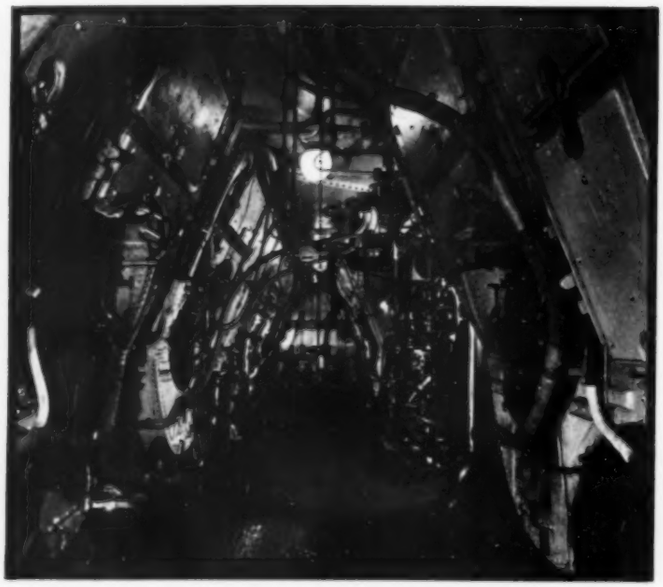
CREW'S BREAD—*MAJESTIC*

PADDED CELL FOR INSANE—*ILE DE FRANCE*

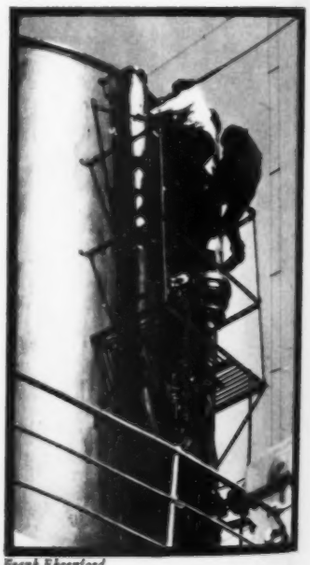


NAVIGATION BRIDGE—*ILE DE FRANCE*

LINE OF LIFE BOATS
BREMEN



BOILER ROOM—*ILE DE FRANCE*



Frank Ebrenford

SMOKESTACK & WHISTLE
BREMEN

THIS PLEASES US MOST

Of the pleasant things said about us by our clients, we like this best:

"Young & Rubicam do their own rejecting. They think all around an advertising plan or an advertisement before they present it for approval."

YOUNG & RUBICAM
INCORPORATED · ADVERTISING
NEW YORK · PHILADELPHIA

Serving the following clients: The Black Flag Company, The Borden Company, Edward G. Budd Manufacturing Co. and Budd Wheel Company, Columbia Phonograph Company, Inc., Devoe & Raynolds Co., Inc., Fels & Co., General Foods Corporation, International Silver Company, Johnson and Johnson, The Norwich Pharmacal Company, Pennsylvania Grade Crude Oil Association, Quaker State Oil Refining Co., Reo Motor Car Company, Rolls-Royce of America, Inc., A. G. Spalding & Bros.

Is there a Jekyll-Hyde coming to work for you?

BY and large, of course, it's a pretty honest old world that goes to work every morning. But there's a dual personality in most of us. Sometimes, it's a *good* and a *better self.* Sometimes, a *good* and a *weaker self.* Why wait then to bond your employees until, under stress, somebody makes off with the "cash box"?

Ætna Fidelity Bonds are more than "common-sense" protection. They not only safeguard you against loss but they exert a *moral* influence on your employees, helping them to withstand temptation. More and more it is the practice to bond "trusted" employees. All "trusted" employees are not *trustworthy.* Those who are, welcome a Fidelity Bond as a sign that all's well.

Ætna writes practically every form of Insurance and Fidelity and Surety Bonds. Protection *all ways—always.* Ætna Service reaches from coast to coast through 20,000 agents. The Ætna agent in your community is a man worth knowing. Look him up!

The Ætna Life Group consists of the Ætna Life Insurance Company ~ The Ætna Casualty & Surety Company ~ The Automobile Insurance Company ~ The Standard Fire Insurance Company of Hartford, Conn.

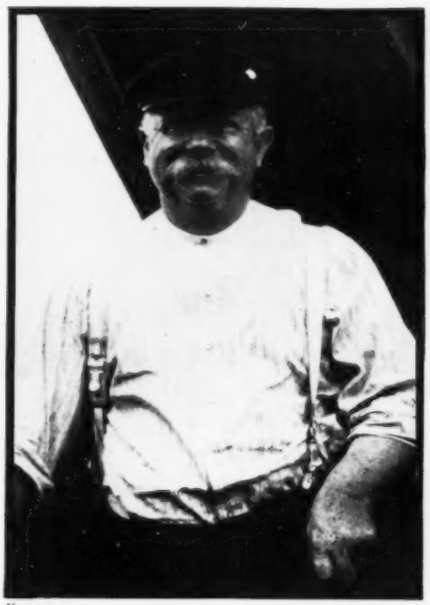
CARNEGIE LIBRARY OF ATLANTA

Faces of the Month

U. & U.

An outstanding automobile executive, John North Willys, has been appointed Ambassador to Poland. Founder and present Chairman of the Willys-Overland Company, Mr. Willys is known as an automotive sales expert. His appointment is significant in view of the Polish loan projected for flotation over here. On this, as on many other matters, Ambassador Willys will confer at length with the American financial adviser to Poland, Charles Schuveldt Dewey (below). When Mr. Dewey came back to Warsaw after his recent trip to America, he found the country in a state of great business depression. Polish reporters flocked to him, eagerly asked his views. Cheery Mr. Dewey reassured his charges: "I see no reason for undue pessimism. . . . It is not so bad in Poland, I assure you."

Keystone



Keystone

On the floor of Long Island Sound, near Hell Gate, lies a Revolutionary pay ship loaded with $4,000,000 in British gold. At least, so believes Simon Lake, "father of submarines," who has invented, designed, and built many a submarine for the United States. His search begins this summer. "If it's there, I'll find it," declares Simon Lake.

Cameragrams

The Bank for International Settlements has elected as a director Gates W. McGarrah, until recently chairman of the Federal Reserve Bank of New York. He will probably be elected president of the international bank.

P. & A.

Not long ago some workmen pried off a number "2" from a house in East Sixty-Seventh Street, New York, and replaced it with a number "4." This apparently trivial action greatly annoyed the owner of the house, ex-Governor Miller of New York, and greatly pleased Michael E. Paterno (above), builder of many a Manhattan apartment house. It meant that Mr. Paterno had won his long legal battle with Mr. Miller over the right to use the number "2" on his new apartment house next door to Mr. Miller's house.

International

Russian industry will outstrip ours in fifteen years, believes William Z. Foster, "the brains of the U. S. Communist Party." His reason: The Soviet is not handicapped by such "capitalistic disadvantages as rent, interest on capital . . ."

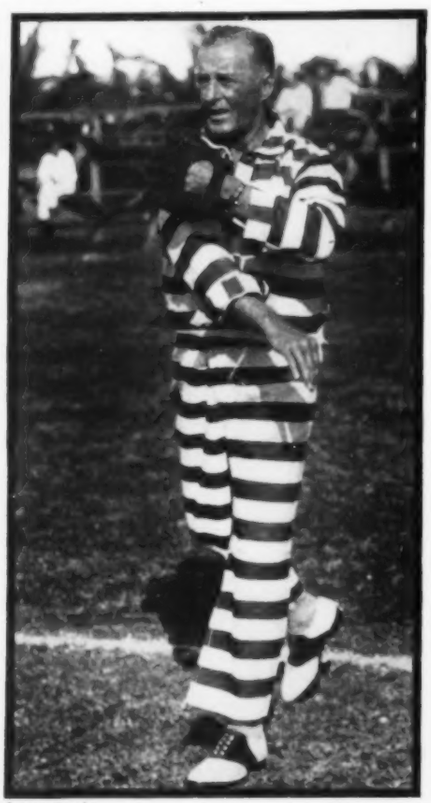
Faces of

International

Chicago's government ignored the city's business men until the financial crash came. Not so Detroit, mother of automobiles. The municipal purse strings are in the hands of an impressive Budget Committee. Left to right the members are Charles T. Fisher (see page 68), Clyde Burroughs of the Detroit Museum of Art, Edsel Ford, and Mayor Charles Bowles.

International

At the head of his Haitian commission, President Hoover has placed one of his ablest proconsuls: W. Cameron Forbes, senior partner of Boston's old mercantile house, J. M. Forbes & Co. Mr. Forbes spent nine years in the Philippines, which included four years as Governor-General (1909-1913). When he is at home, Mr. Forbes holds patriarchal sway over the Forbes family on Naushon Island, Massachusetts. The Haitians have received the Forbes Commission with respect and even enthusiasm.



International

Edward F. Hutton is wearing stripes of his own free will. None the less, Grover Whalen, New York City's high-powered police commissioner, is the man responsible for his misfortune. The Commissioner's baseball team, the "Cops," conquered Mr. Hutton's "Convicts" in a game played at Palm Beach not long ago. The score was 8 to 3. Commissioner Whalen caught for the "Cops," bruised his fingers, batted .500. Mr. Hutton donned a mask and caught for the "Convicts." His batting average is not revealed.

U. & U.

Gold in the Orient. On February 1, 1930, the Chinese Government began collecting import duties in gold—a step toward a gold standard. Immediate cause: the collapse of silver prices. Basic cause: the report of a commission headed by Professor Edwin Walter Kemmerer, of Princeton (above), advocating a gold standard. Below is Japanese Minister of Finance Inouye signing, or rather painting, a state order: "Lift the embargo on gold exportation." The raising of the embargo, in force since 1917, means that Japan has returned to the gold standard, and, more important, that her fiscal condition is once more flourishing.

Wide World

the Month

U. & U.

Cyrus Hermann Kotzschmar Curtis, publisher of the country's most favored advertising medium, the *Saturday Evening Post*, has received the country's leading advertising award: the Harvard Business School Gold Medal.

Cameragrams

Manuscript coup of the month, and of many months, was the purchase from the Royal Institution by Dr. A. S. W. Rosenbach (Philadelphia) of the official records of the British Army during the Revolution. The sale displeases Ramsay MacDonald, pleases Dr. Rosenbach, who terms the deal the most important in his career.

Guggenheim Bros. consists quite literally of Guggenheim brothers: left to right, Simon, Daniel, Murry, Solomon. More noted as coppermen (Kennecott, American Smelting & Refining) than as bankers, the Guggenheims surprised financial Manhattan by appearing (in a statement by J. P. Morgan & Co.) as members of the famous Bankers' Pool of last October, along with National City, Bankers Trust, and the rest. Like the early Rothschilds, the brothers work in close coöperation, even to the point of sharing a single private office.

P. & A.

P. & A.

The British Astors have been buying and selling American real estate. *Sold:* Beaulieu, the Newport estate of the late William Waldorf Astor, founder of the British line, to Mrs. Grace Graham Vanderbilt. The purchase price was $140,000 plus an undisclosed amount for the interests of the three British Astors: Major John Jacob Astor (right), Viscount Astor (left), husband of fiery Lady Nancy Astor, and Mrs. Pauline Spender-Clay, née Pauline Astor. They are the heirs of the William Waldorf Astor Estate. *Bought:* 8-12 East 34 Street, New York City, from the musical firm, C. H. Ditson & Co. The Estate already owns 2-6 East 34 Street and 341-347 Fifth Avenue. These holdings, once part of the old Astor farm, form a large and valuable corner plot on Fifth Avenue.

Faces of the Month

International

Carl Gray, Jr., son of the president of the Union Pacific, has been appointed general manager and first vice-president of the Chicago, St. Paul, Minneapolis and Omaha Ry. He started as a clerk five years ago. His good but unusual reason for not entering the Union Pacific was that his father was president.

Keystone

Few American bankers take dolls seriously. It is otherwise in Japan during the annual Doll Festival on March third. On this solemn occasion, Viscount Shibusawa (above, energetically speaking at a League of Nations rally), "the J. P. Morgan of Japan," was pressed into service. He presented copies of *Dolls of Friendship* to the Empress Dowager and to Princess Takamatsu. The books tell the story of some thousands of dolls that were exchanged between the children of America and the children of Japan during the Doll Festival of 1927. The benevolent Viscount, grand old man of Japanese business, made a good doll ambassador extraordinary to the Empress.

P. & A.

Reorganization of a company calls for quick-thinking lawyers. A key man in the confusion of the Fox companies is Robert Taylor Swaine, distinguished partner in the Manhattan law firm of Cravath, de Gersdorff, Swaine & Wood, and now chief counsel for the Bancamerica-Lehman-Dillon Read syndicate.

P. & A.

The youthful American Express Bank and Trust Company, sired by the Chase National Bank and dammed by the American Express Company, has a youthful president: Medley G. B. Whelpley. Born in Canada 37 years ago, Mr. Whelpley has been a Chase vice president since 1926. The bank he heads will open in April with a paid-in capital and surplus of $15,000,000.

International

In blistering, sun-scorched Death Valley, Nevada, stands a $2,000,000 mansion, a prodigious gesture of the prodigious "Death Valley Scotty". It is only half built because Scotty now finds himself dead broke. His mysterious "gold mine" has gone back on him.

U. & U.

Before the dazzled members of the House Patents Committee appeared Mary Evelyn ("Fiji") Bendelari, pretty, clever, determined, and twenty-seven. Her theme: that shoes are works of art and hence should be protected by copyright. This was indeed an inspiring theme to Fiji, whose many designs have included the Deauville sandal.

The FIRST
NATIONAL BANK *of* BOSTON

Every important **NEW ENGLAND** *interest, and many of national and international scope, are brought together around a single council table in the directorate of* **THE FIRST NATIONAL BANK** *of* **BOSTON.**

Affiliated Institutions: Trust Service, OLD COLONY TRUST COMPANY
Investments, The FIRST NATIONAL OLD COLONY CORPORATION

A Budget for a $50,000 Income in New York

The high cost and necessity of artichokes and *sauce mousseline*. And how Incidentals forbid Olivia more than one new evening coat every other year.

I AM closer to thirty-five than to thirty. I am married, have a child, and as vice president of a commercial bank downtown earn $20,000. Fortunately in my not too early youth I was given some securities to have and to pyramid. A few more came our way when I married Olivia some ten years ago (*ah, senectu*). The income of all these now totals another $20,000. The rest, for I average $50,000, comes from the market. Last year (I dodged the cataclysm) I made about $55,000; this year I shall make less. I manage to spend it thus:

The apartment on Park Avenue (in the eighties and conveniently close to the 86th Street subway on Lexington) costs $7,000, and that fortunately includes a room on the second floor for the child's nurse. Food, ice, milk, gas, light, telephone, and the laundry, the omnipresent laundry (we are five in the household), come to $650 a month with little or no fluctuation. To this for furniture I add another $50. By "furniture" I mean replacing the maid-broken plates from our Davis Collamore sets, repairing the leg of the table that Jimmy Du Val inadvertently but inevitably broke. Furniture this year may mount perilously. Olivia says that the dining room simply *must* be done over, and she wants it in silver as a background for those two Dulacs her uncle gave her. Well, the sitting room furniture and curtains can do another winter, but even without attending to them $50 a month for such items is low. However, we can borrow from the $650 for food and laundry, and the average of $700 a month ($8,400 a year) seems reasonable.

In all this you will notice that I have not accounted for a single new Ludwig biography, nor the renewal of a dozen magazines, nor for gin, vermouth, and the post-prandial Scotch. For books, magazines, tobacco, and liquor I allot $150 a month. Item: a case of champagne costs just about that. Extra dry, it is also extra: the month we bought the twelve merry Veuves, this department cost $300. Twenty-one hundred dollars, or thereabouts, a year then we expend on these necessary luxuries. We could cut it down measurably, I think, if we went on the wagon, which would be easy, and persuaded our friends to do likewise, which makes it impossible.

Servants—the very word sounds like a bell. The nurse has to be good, and the price of her starched cuffs and smattering of Adler psychology is $125 a month. Olivia insists upon, and I certainly like, a good table. The poached eggs, *sauce mousseline* on hearts of artichoke, and the apricot soufflé that graced the particularly festive meal we had a week ago were prepared by—Olivia calls her an artist—and the price of her artistry is $90. Our maid serves the table and makes the beds. She gets $80. When we have several guests we call up our favorite employment agency and get an auxiliary maid whom we know and whom we can count upon not to spill the soup or forget the coffee spoons. But that is only an occasional $10. The salaries of the regular servants total a yearly $3,540. Add the apartment's $7,000, its upkeep's $8,400. The liquor and books, as we remarked before, come to $2,100. Our total thus far, I notice, is $21,040.

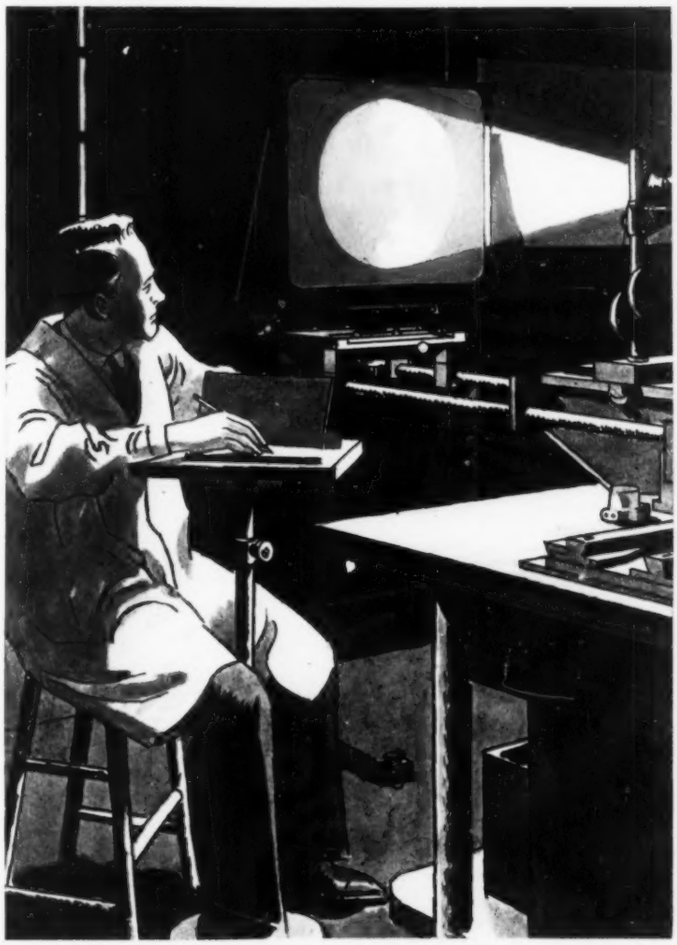
The theatre comes every year in New York with winter never far behind. The season lasts roughly from the middle of September to the middle of April and we all, of course, go. Unless you make a trip to Hoboken where, as the New York *World* noted, Christopher Morley recently discovered where the red begins, or venture to West Fourteenth Street where Miss Le Gallienne speaks only to Chekhov, we can find but few seats not stamped $6.60. The Guild, not infrequently dull, costs less ($33 for two season seats for six performances; $40 if you go Saturdays). Olivia and I go Thursdays. Of course, we could save money by subscribing to four or maybe six

BUDGET FOR NEW YORK

EXPENSES (constant)			
Apartment's rent	$ 7,000		
Apartment's upkeep—food, light, heat, etc. (including upkeep of summer house when apartment is closed)	8,400		
Servants' salaries	3,540		
Books, liquor, and tobacco	2,100		
Theatre and night clubs	1,400		
	$22,440		$22,440
Clothes—Hers	$ 5,000		
His	1,000		
Child's	600		
School	500		
	$ 7,100		$29,540
Doctor	$ 1,000		
Dentist	500		
Life insurance	850		
Jewels, etc., insurance	150		
	$ 2,500		$32,040
College club dues	$ 50		
Racquet club dues	250		
Downtown club dues	50		
Downtown club expenses ($50 a month)	600		
Other club expenses ($25 a month)	300		
	$ 1,250		$33,290
Summer house	$ 3,500		
Car — Gas and oil $2 a day for 5 months		$300	
Car — Insurance		75	
Car — Winter storage (7 months) and troubles		410	
		$785	785
Summer club	600		
Summer parties	300		
	$ 5,185		$38,475
EXPENSES (variable)			
Incidentals—Christmas, charity, trips, taxes, mothers-in-law, etc. (see text)	$11,525		$50,000

A RAINBOW

now helps to make Better Machines



UP the hill to the busy Westinghouse research laboratories in East Pittsburgh come engineers of a great industry asking, "What shape shall we make these machine parts to get the greatest strength from our materials?"

Light flashes on a snow-white screen. Outlines of the machine part appear. Then someone turns a loading screw and areas of color are seen changing their hues as the load on the test model increases. Black turns to gray, gray to yellow, yellow to red, brown, green and so on. In this manner the machine part appears in colors of a laboratory rainbow that tells its own story for keen eyes to read—a well-directed ray of light discloses where the heaviest stresses are to be provided for.

"Photo-elastic tests" the engineers call them. And from tests like these, slight changes in shape give vast gains in strength without added material. Sometimes even less material actually gives greater strength. A laboratory rainbow does what the most elaborate calculations could not do.

These tests are but one instance of the methods by which Westinghouse research is engaged in finding new ways to help dollars in industry, in business, in homes, obtain larger returns for those who spend them. In finding and applying new facts, and in discovering new ways to use old facts for new gains, Westinghouse serves the modern electrical age in which you live.

ELECTRIC POWER BUILDS BUYING POWER

Westinghouse

season tickets and inviting our friends to Guild plays instead of to the more expensive ones. But nearly everyone does the Guild on his own. We'd undoubtedly be stuck with extra tickets, and too much *Red Rust* and Shaw is not good for the servants. Accordingly, when we invite Jimmy and Elise and the Johnny Moultries, theatre tickets cost approximately $55. And since Elise likes to dance—and I might say so does Olivia—we go to the Lido or the Embassy. The Lido's Maraschino will present us with a check for another $50. At the Embassy it is cheaper, but it costs us $150 to join. Such fiestas are fortunately rare. But theatres and night clubs make monthly inroads of circa $200 during the seven-month season, and lay claim to $1,400. Adding everything together we arrive at a total, at this point, of $22,440.

Oh, yes, I go to the office in the morning, and most nights I stay home. But somehow when one thinks of Manhattan expenses, one's mind turns dolefully to such as the above listed. And now—since sooner or later we must—let us consider the couturier, the doctor, the insurance agent, the high price of shoes.

For Olivia's clothes we budget $5,000, which generally must be stretched, and which seems to allow her only one new evening coat every other year. For my clothes I allow a yearly $1,000. Few men, I think, spend much more than $10,000 for clothes in ten years. The child's frocks and frills cost about $600. And since I have just mentioned the child (who is nine), may I here say that her tuition in a good private school is $500. In a few years it will be more. Clothes do not break the man, but when they do not cost $7,000 or more they cost $6,600, which is the sum we herewith budget. I add the $500 which it costs to deck the child's mind and reach a new high total of $29,540.

I dare not allow less than $1,000 for the doctor and $500 for the dentist. That I believe not overcautious. Also I am insured in Olivia's favor for $50,000. I took out a $10,000 policy when I was twenty-one, and a $40,000 policy at thirty. For the two of them I now pay about $850, but dividends will gradually decrease this. Insurance on jewels and a few *bibelots* Olivia likes costs approximately $150. In other words, I pay $2,500 a year to insure my possessions and health and to take, in Olivia's name, an economic fling at death.

Let us for a moment consider city clubs, and our city expenses in large part are over. Olivia's mother, as a wedding present, promised to pay all her dues and bills at the Colony so that's out. I belong to my college club, where the dues are only $50 and to the Racquet—$250. But my expenses at both average no more than $25 a month: an occasional game of squash, a cocktail, an occasional dinner. My lunch club downtown presents bills that average $50 a month; its dues are $50 a year. I recapitulate and total: all the doctors and all the insurance men get $2,500; the stewards and the club treasurers get $1,250; I add what *Variety* might call the resultant three and three quarter grands—of my assured $40,000 (remember that $10,000 or so is supposed to come from the market) I have taken $33,290.

When spring is icumen in we must think of where Olivia can go where she will not be bored to death, and where the kid can go where she will not die from city heat and carbon monoxide. We could rent a house on Long Island but if they are nice, they are high. Rye or Greenwich answers the purpose admirably. Olivia has friends there, I can commute, the child can swim at Manursing Island, and the apartment—with or without the silver dining room—can be closed. We rent a house for $3,500 (we have never decided to build or buy because we haven't got the money and anyway we are not sure where we want to go), take the servants, and out we go. Our upkeep fortunately does not rise with the thermometer; neither, however, does it drop. The car comes out of storage ($40 a month in the city), and Olivia is prepared to meet my train and bounce about the countryside, spending, I should say, $2 a day for gas and oil. In the city we rarely use it, except in the fall for football games, to which annually we swear we will never drive again. The insurance of that automobile, I might add, is $75. Its tires, its summer baths, its minor troubles (rather arbitrarily) $130.

Of course, during the summer, we have to go to parties somewhere on the Boston Post Road and occasionally take a table or so at Canoe Place Inn. We bring our own refreshments and if (when we are visiting on Long Island) Olivia can be persuaded not to risk what she calls a modest sum somewhere in Montauk, the price of the summer's Saturnalia is not much more than $300. In addition we have to join the club. The dues are $100, and during the five months that we use it, we spend about $500.

To carry on the addition which we left at the first signs of spring: the care of the car calls for $785; the summer house, $3,500; the summer club, $600; the summer parties, $300. All this (I have added and you need not bother) makes for $5,185. And (I wonder if the child could do this sum?) $33,290 + $5,185 = $38,475.

Thus of that aforementioned $40,000 assured, we spend $38,475 which, if the worse came to the purse, would leave us a $1,500 or so to start the new year with the silver dining room and the sitting room furniture that can do for another year. But comes another item, evasive to budget, which creeps upon us unaware and is ever present, which for want of a better name—oh, badly, for want of a better name—I call incidentals.

Caviar to the mother-in-law

Incidentals, ladies and gentlemen, are Christmas presents, Easter flowers (I like not organized holidays), wedding presents, anniversary presents, flowers now and again but oftener again. Incidentals are caviar to the mother-in-law who goes to Europe, charity, petty cash, my two weeks' vacation (if I don't spend it at the summer place), various fall week-end trips, the silver fox that couldn't wait for Christmas, taxis at rates that please Police Commissioner Whalen. I have heard from afar off the rumor that a next year incidental may be a mink coat, which could not very easily come out of Olivia's $5,000 for clothes. Perhaps the coat may suffer a sea-change into a short trip to Europe. Trips to Europe may sound expensive and therefore, I suppose, important. I repeat—they are incidentals. And man, I know, is also a taxpayer.

My taxes come to about $4,000. I have never been quite sure how they reach that figure, but a friend of mine at the bank assures me yearly that the Government and the State are not getting the best of me. In fact, he often adds—but why should Government or State read about that?

As I did to my dentist, my bootlegger, to the ceiling over my head, I do not to incidentals assign a definite figure in my budget. No act of volition is this. I cannot. The $10,000 or $15,000 which puts my income at $50,000 is a variable. When the bank and trade winds are favorable, I pay more for incidentals; when they are ill-willed, I pay less. Our $40,000 very nicely takes care of our New York necessities. The rest must do (indulge the phrase) for our necessary niceties. We buy no pearls when we cannot afford them, and there are other coats than mink. But the incidentals always claim virtually the entire amount above the $40,000. There is little reason, unless sumptuously we build a yacht, why incidentals should ever cost more than $10,000 or $15,000. When and if I make $75,000, I shall, therefore, save. If I make $300,000—why, I shall yacht. Excuse such optimism, but we predicated frankness.

Now all this budgeting, if it seems extravagant, is nevertheless based on a few fairly sound presuppositions. Without discredit of conceit, I admit that I have confidence in myself. In other words, I believe that this my income at "closer to thirty-five than thirty" will increase. Unless that increase is very large, my present living expenses, insuring as they do a reasonable amount of comfort and pleasure, need not increase with it. Therefore, the expected increment to my earnings will be relegated to pure saving. In my old age I shall have enough tobacco for the pipes which I shall smoke with my books and a few choice friends. And, Olivia, sir, will have enough money to purchase the best wool for her knitting if this be the way age affects her. Also, of course, the pure saving will facilitate the destiny of the kid—or kids.

I admit that just because many of the people I see downtown, on Long Island, or about the city are richer than I is not reason enough *per se* for me to do the same things they do, and, therefore, spend approximately the same amount of money. But, you will admit, that with the present-day habit of mingling business and social affairs, it is fairly sound business sense to be with these people. As a member of the bank, I can thus profit the bank. And, as an individual, I add that I enjoy their company. If I did not—but that is somebody else's story and budget. The best things in life are not free, but they are always around. Even though today I do not save, I find sufficient reasons, social, business, personal, to justify my sharing in these things at this time.

Of course, it sometimes depresses to think that this income, which once seemed a very considerable sum, should be spent so easily and with so little of it set aside. I observe the figure: $50,000. Jurgen, I remember, remarked, "How one's women mount up." I, a budgeter, contemplate figures of different curves, but wonder too at their mounting.

Your city . . . a world port!

THROUGH azure blue and inky blackness . . . through fair skies and storm . . . sail the winged squadrons of commerce.

Swooping down with passengers and merchandise, they land at ports, some conveniently located, safe and modern . . . but at many others that furnish poor contrast to the planes which glide down from out the clouds. At other points, sometimes where great cities spread out below, airport facilities are totally lacking.

Aware of the fact that aeronautical facilities of today are but forerunners of tomorrow's accomplishments, Austin has been contributing advanced ideas in the field of aviation for more than a decade. By virtue of a well-rounded service, this nation-wide organization has successfully carried through to completion airport projects, hangars and aircraft factories in 21 states and 37 cities from Coast to Coast.

Awake to the future, Austin is constantly at work, planning new improvements that make each successive achievement more noteworthy . . . more vital a part of the amazing pattern being woven in the name of Aviation.

To those individuals and organizations with aviation programs, Austin offers sound counsel and advanced airport engineering ideas. A copy of the interesting booklet "Airports and Aviation Buildings" —3rd edition—as well as approximate costs and additional information, will be gladly furnished for your project, of any type or size, anywhere. Wire, phone or write the nearest Austin office.

AUSTIN ACTIVITY IN THE AVIATION INDUSTRY EMBRACES: AIRPORTS—Preliminary surveys and reports; Site selection. COMPLETE ENGINEERING—Including topographical map; detailed plans and specifications for grading, drainage, lighting, runways and all airport buildings. COMPLETE CONSTRUCTION—Grading, drainage, lighting, runways, air depot, hangars, shops, flying schools and aeronautical factories. HANGARS, aircraft and accessory manufacturing plants—designed, built and equipped, complete from preliminary plans to finished buildings.

THE AUSTIN COMPANY

The AUSTIN METHOD *of Undivided Responsibility*

Design, construction and building equipment . . . separate responsibilities ordinarily . . . become one unified responsibility under The Austin Method. One nation-wide organization handles the complete project under one contract which specifically guarantees in advance, total cost, time of completion with bonus and penalty clause if desired; and quality of materials and workmanship.

THE AUSTIN METHOD

ENGINEERS AND BUILDERS . . . CLEVELAND

New York Chicago Philadelphia Newark Detroit Cincinnati Pittsburgh St. Louis Seattle Portland Phoenix
The Austin Company of California, Ltd.: Los Angeles, Oakland and San Francisco
The Austin Company of Texas: Dallas The Austin Company of Canada, Limited

THIS office holds a wealth of inspiration for its occupant, and gives a correct impression of his personal good taste. ¶ Such surroundings promote the spirit of relaxation and detachment, so necessary to the clear thinking demanded by business today. ¶ The service of the William F. Wholey Company includes the expert planning of office space, interior architectural design, decoration, lighting and furnishing, together with the execution of every detail by a trained, unified organization of specialists. ¶ Recommendations and sketches will be furnished without obligation to interested business executives and professional men.

The William F. Wholey Co. Inc. *Equipment Specialists* 11 East 36 St. New York

Mr. Grigsby Mr. Grunow

Mr. Grunow's finch must work for its dinner. Mr. Grigsby owns no bird.

On clear nights the stars in the heavens above Lake Geneva in Wisconsin shine on the estate which radio millions have bought for William Carl Grunow. On such nights William Carl Grunow and his friends sit upon the lawn and look up at the stars. In his factory Mr. Grunow is the explosive, profane driver, posting placards, "Don't Begin To Think You're Good," pushing production to above six thousand radio sets a day. At other times and other places Mr. Grunow is the debonair, handsome prince of fortune. But here on his clipped lawn Mr. Grunow turns his head up to the stars. In his philosophic evening hours, whenever he could find time from business, Mr. Grunow has been looking at the stars for years.

"Anybody who doesn't believe in God," he announces, "is a God-damned fool."

• • •

Bertram James Grigsby, slight, uncommunicative financier with a leathery face, deeply lined, and a bald dome of a head, leaves all ferment to his partner. In the Grigsby-Grunow Company he devotes himself to finances, and out of business there is his unpretentious home in Park Ridge near Chicago and in it once a week the regular game of the Park Ridge bridge foursome.

The game is in progress in a smoke-filled room. About the green table are Grigsby of radio, Spielman of yeast, Richtsteig of garters, and an advertising salesman named Petrie. The host is dealing, deftly, as he learned to deal while he was acquiring his poker face at the University of Illinois.

"Jim," says Petrie, grinning at Grigsby, "I hear you went rabbit hunting."

The deal slows down.

"Oh, I went out the other day."

"Did you get any rabbits?"

The dealing comes to a full stop. Mr. Grigsby grins, too.

"Well, no," he admits, "but I saw one. Just as I raised my gun to shoot him—they used to shoot rabbits when I was a boy in Cuba, Illinois, but this was the biggest rabbit I ever saw—well, just as I raised my gun to shoot, I slipped and fell into a swamp."

"A swamp?"

"Yes, a swamp. I gave up the idea of rabbit hunting. Come on. Let's play cards."

• • •

A nebulous plan is no doubt better than no plan at all. To that extent the Grigsby-Grunow combination was well off when it began in 1921 with $37,500 capital and a determination to "manufacture something." What their product would be, they were unable to say until a vision came to Orville Quincy Hinds, in those days a partner, while he and Grunow were riding on the back platform of a crowded Chicago street car. It was a sunny day. Hinds noticed an automobile equipped with a windshield sun-visor. The driver was trailing the street car undisturbed by the sun's glare although it shone directly upon the windshield.

"Why don't we make some of those?" he suggested.

"Say," shouted Grunow, "that's a great idea!"

• • •

Four partners in the business in 1925 all knew that business was bad. The difference between them was that two believed it would be worse, and two had faith that it would be better.

"We'll sell out," said Hinds and Grigsby's younger brother.

They were looking at a quarter million dollar debt with hardly anything to balance it in the assets column. It marked the culmination of consecutive misfortunes. The sun-visor business had been destroyed when automobile manufacturers began putting out cars already equipped with them. That first catastrophe occurred at a time when they had on hand $350,000 worth of a celluloidlike du Pont product called pyralin out of which they made the visors. All of it would have been high-piled junk but for the discovery that the newfangled radio horns could be made of pyralin. Then the new type of cone horn appeared and doomed their pyralin horn. They shifted to a battery eliminator for radio sets, but it was not yet perfect. Debts were accumulating.

"We'll sell out," said two partners, "for half what we put in."

The elder Grigsby and Grunow talked it over.

"We'll buy," they said.

• • •

In 1927 radio manufacturers began producing sets already equipped with eliminators. Grigsby went to one of the backers: "Unless we find something else to do, we'll be out of business January first."

At the long table of anxious faces, Grigsby turned their troubles into Grunow's dramatic hands. No tables in the Grunow business and social connection are covered with plate glass. He bangs with a hard fist.

"God damn it! Let's make radios ourselves. Put our own eliminators in them and sell the whole thing faster and cheaper than anyone else."

"Bill Grunow," said one of the backers, "you're crazy."

• • •

Seven days later Grunow and Grigsby showed their backers an operation radio set built in their own shops. From it came the Majestic Radio. Grunow flung the Majestic Radio at the world. It had no squeaking past to damn it as did the new models of the old firms. It was a good radio, new, cheap. He advertised. He inaugurated the Majestic Theatre of the Air over the Columbia broadcasting system in the fall of 1928. He spent thousands on the programs. For him Ring Lardner wrote a play exclusively for radio production. Edgar A. Guest wrote and read poems to Majestic Radio listeners. And Mr. Grunow signed Moran and Mack for twenty-six weeks at a salary of $7,500 a week. That team is broken now, but in those days the Two Black Crows climbed to fame and pushed Majestic sales into thousands a day.

"Yeah, I don't blame you," the dusky voice drawled for Mr. Grunow. "It wasn't your fault. That was the devil in you knocked that man down."

"Yeah, the devil may have made me knock him down, but that jumping on him was my own idea."

[*Continued on page 138*]

The Plot

Than the enterprise of Mr. Grigsby and Mr. Grunow, none was more spectacular during the Golden Age of Coolidge. No product was so overnightly successful as their cheap, sonorous Majestic Radio. Here presented are a few lifelike sequences in the dramatic Grigsby-Grunow scenario.

Having produced a large share of the seven million radio sets to which Presidential Candidate Hoover called attention during his campaign, and more sets in 1929 than any other manufacturer, Mr. Grunow has named his 1930 models "Prosperity" in response to the President's general appeal for the same. Opportunist and Stentor, Mr. Grunow presses on though the radio business sags and his company's stock still wavers just above the price of the stock market crash. With dynamic drive, careless courage, profligate power, he whips, inspires, and energizes the men about and under him. He works them into neurasthenia, then sends them off for a convalescing holiday.

Now Mr. Grunow has announced June, 1930, as the date of his entrance into the well-established electric refrigeration business. Not that Mr. Grunow has invented anything or developed anything, but just as there was a demand for radios so Mr. Grunow sees a demand for electric refrigerators. It is enough.

The end of Reel I in the Grunowesque drama was the stock market crash. Whether Reel II will be worth shooting, whether Grigsby-Grunow stock will again excite speculative Chicagoans, is doubted by some. But never, never by Mr. Grunow.

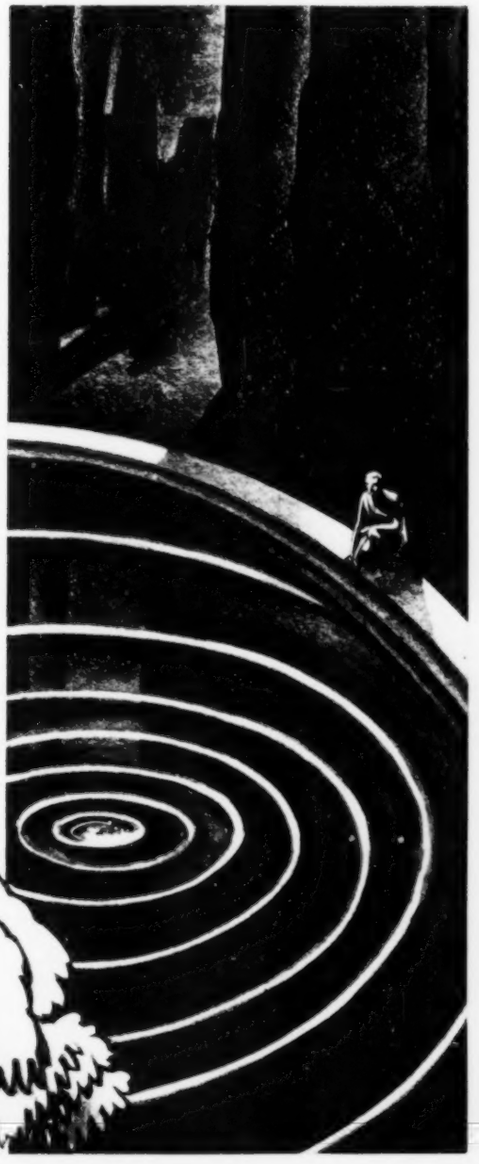
Three opinions may be summarized:
The Trade's: "It can't be done."
The Distributor's: "We hope it can be done."
Mr. Grunow's: "The hell it can't! It can!"
Mr. Grigsby is also in the picture.

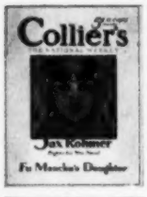
In the United States little boys who dream of imperialism are pictured as sons of Communists who wake up screaming after a nightmare in which President Hoover, riding on a pink elephant and aiming an imperialistic machine gun, mows down the entire Nicaraguan people.

But little English boys dream sweet, natural dreams of imperialism or rather of the dear old Empire. A new British film—produced in the spirit of Peter Pan by a company stodgily called British Instructional Films, Ltd.—shows a nice little boy, Master Douglas Beaumont, trudging in his sweater and shorts through the very nicest dream, a dream in which the background is Buckingham Palace, loaned for the first time by His Majesty to make possible the production.

Trudging at last into the Royal Kitchen, Master Douglas watches cooks pour sweetmeats from all parts of the Empire into George V's Christmas Pudding. Straightway the little boy sets out on the swift wings of dreams to visit all these places, and it is an arresting fact that to make the movie the thirteen-year-old hero actually did travel more than 20,000 miles. Aptly the imperial picture is called *One Family*.

THE LARGEST MAGAZINE
CIRCULATION UNIT IN AMERICA





Now.. More than 8,500,000 circulation

A FEW MONTHS AGO we announced that the combined circulations of the five Crowell Magazines had passed eight million—the largest magazine circulation of any publishing house in America.

Today more than a half-million has been added to that total.

More important than the size of these figures is the Crowell editorial policy, which is responsible for this record circulation growth. For Crowell Publications are intimate, helpful, and progressive. They suggest improvement, broader thinking, greater achievement.

To the manufacturers of modern products the increased demand for Crowell Magazines is significant of an unsatisfied market for anything that will contribute to better living conditions, better health, or greater happiness.

The importance of the Crowell market is being recognized today by leading advertisers. Their orders already placed for space in 1930 issues exceed those for similar issues a year ago by more than two and a half million dollars.

WOMAN'S HOME COMPANION · THE AMERICAN MAGAZINE · COLLIER'S · THE COUNTRY HOME · THE MENTOR

Crowell PUBLICATIONS

MORE THAN 8,500,000 CIRCULATION

Gillette's 800,000,000 Market

The shaver, like the artist, is never quite happy. But Gillette, doing its best, sells three times as many razors as its nearest competitor and last year netted $13,581,683.41.

BY FAIRLY logical association, most people think of big business in terms of big things. The much-repeated phrase conjures images of locomotives, steel bridges, lumber, ships, shares, millions of shares. Yet most people will admit that it is possible to profit more in making a pencil than in building a skyscraper. Relatively and, in some cases, actually. Take, for instance, as small and intimate an object as a razor blade. Take the Gillette Safety Razor Company with its total net (since its founding in 1901 contemporaneously with U. S. Steel) of $139,449,092. With its assets of $57,000,000 and its 2,205,000 shares of common stock with an approximate market value of $213,000,000. A business, furthermore, with an assured market because there are in the world 800,000,000 males with shavable beards. And Gillette has served only 115,000,000; and American Safety Razor (its closest competitor) only about 35,000,000. A business with an assured market because in the United States alone 2,500,000 youngsters come of shaving age yearly.

• • •

Speak not of Fords to the owner of a Chevrolet. Or of Chevrolets to the owner of a Ford. The difference between these two products may be largely temperamental, but the owner of the one or the other has the loyalty to his possession of a 1912 English suffragette to her cause. But even to your confirmed Gillette user, speak of a new razor like, perhaps, the De Haven Syncrokeen (to sharpen the blade you merely jiggle the razor). He will try it. The shaver, one gathers, is like the artist. He always yearns for something better . . . his is always a slight disappointment in that which he achieves . . . he is never completely happy. It is an irony in the saga of Gillette or any other razor company that it makes its profit by mass-distributing slight matutinal disappointments. Meanin', as Trader Horn would have it, no offense.

• • •

But if shaving is perforce a nuisance, it is the ambition of Gillette to make it as little a nuisance as possible. Behold, therefore, in this year of grace 1930 (and in the year 29 of safety razor shaving) a new razor and a new blade. No more "razor pull," the advertisements tell you, no more wiping, no more rusting, a new finish for the steel blade. And the four corners of the blade are cut out, so that if you drop the razor and dent it you do not affect the tension on the blade and alter its delicate adjustment within the razor. Shrewdly the Gillette company so fashioned the new blade that it will fit the old-style razor. Thus customers who will not part with their old razors may still use them. But the old blades do not fit the new razor. Anyhow, no more old blades are being manufactured.

• • •

This is what happened to the last old-style blade. It was manufactured on October 15, 1929. Its number was 5,318,436,976 (the number of the last old-style razor was 115,272,539, an average of forty-six blades to each razor). Mr. Frank J. Fahey, vice president and general manager of the company, took the five billion, three hundred and eighteen million, four hundred and thirty-six thousand, nine hundred and seventy-sixth blade, placed it in the very first Gillette razor, solemnly shaved himself, and pronounced the results excellent.

• • •

The American Safety Razor Company (Gem, Ever-Ready, Star) is also reported planning a new razor and blade. Perhaps we verge on a new shaving era. And painters will forget how to paint beards.

• • •

Largely humanitarian and social are Gillette's self-given reasons for their perfection of a new razor. But, emphatically, there was the question of patents. Most of the original Gillette patents expired in 1921. This gave other companies like Dunhill's, Probak, Darwin, an opportunity to make blades that fitted Gillette razors (it is, of course, on the sale of blades that one makes money). Gillette firmly protests that these incursive companies had no effect on Gillette's sale of blades. Largely, they think, because Gillette blades fit Gillette razors to the thousandth of an inch. Other blades, they believe, are not so finely adjusted. Nevertheless Gillette attorneys are anxious to return to the halcyon pre-1921 days when both blade and razor were protected by patent. Patents on these, therefore, have been applied for by Gillette. But here is a curious thing. Probak manufactures a blade that will fit the new Gillette razor. Probak, like Gillette, applied for a patent. And Probak has received it.

• • •

"It is called to our attention," said John E. Aldred, chairman of the board, on February seventh, "that during the past few days numerous rumors have been circulated, mainly in stock market circles, in regard to the Gillette company. These rumors are so contrary to facts as to appear to be a deliberate attack upon the company.

" . . . These rumors are mainly directed at the new razor and blade . . . it seems proper that your officers should state the facts . . . to the end that shareholders may not be disturbed by any false statements.

"Production was entered into only after an exhaustive study convinced the management that it would constitute a long step forward . . .

"The development involves certain patents . . . Based upon the advice of our attorneys we are pleased to assure you that the patent situation, as well as that of manufacturing and sales, is being developed in a usual and orderly manner and that we anticipate no delay or difficulty in producing and distributing the new product."

• • •

The usual and orderly manner, however, involved even greater production than Gillette anticipated. Their entire 1930 output is already sold. During the last three months of 1929 Gillette curtailed production of the old-style product, cleared dealers' shelves to receive the new. But demand has been so great that the Gillette plant in Boston, according to its latest figures, is manufacturing 80,000 razors, 2,700,000 blades a day. And their days, of late, have been twenty hours long.

• • •

A Gillette blade *can* be honed, *can* be stropped. But by so doing you are apt to destroy the edge (the company manufactures approximately 132 miles of shaving edge a year). It is better to throw the blade away, they will tell you. Better for your face and, of course, better for the company's profit. Contrary views are heresy and anathema.

No one in the Gillette company will tell you what happens to the old blades. To mention the question shows you are an outsider. Tactfully, they will change the subject.

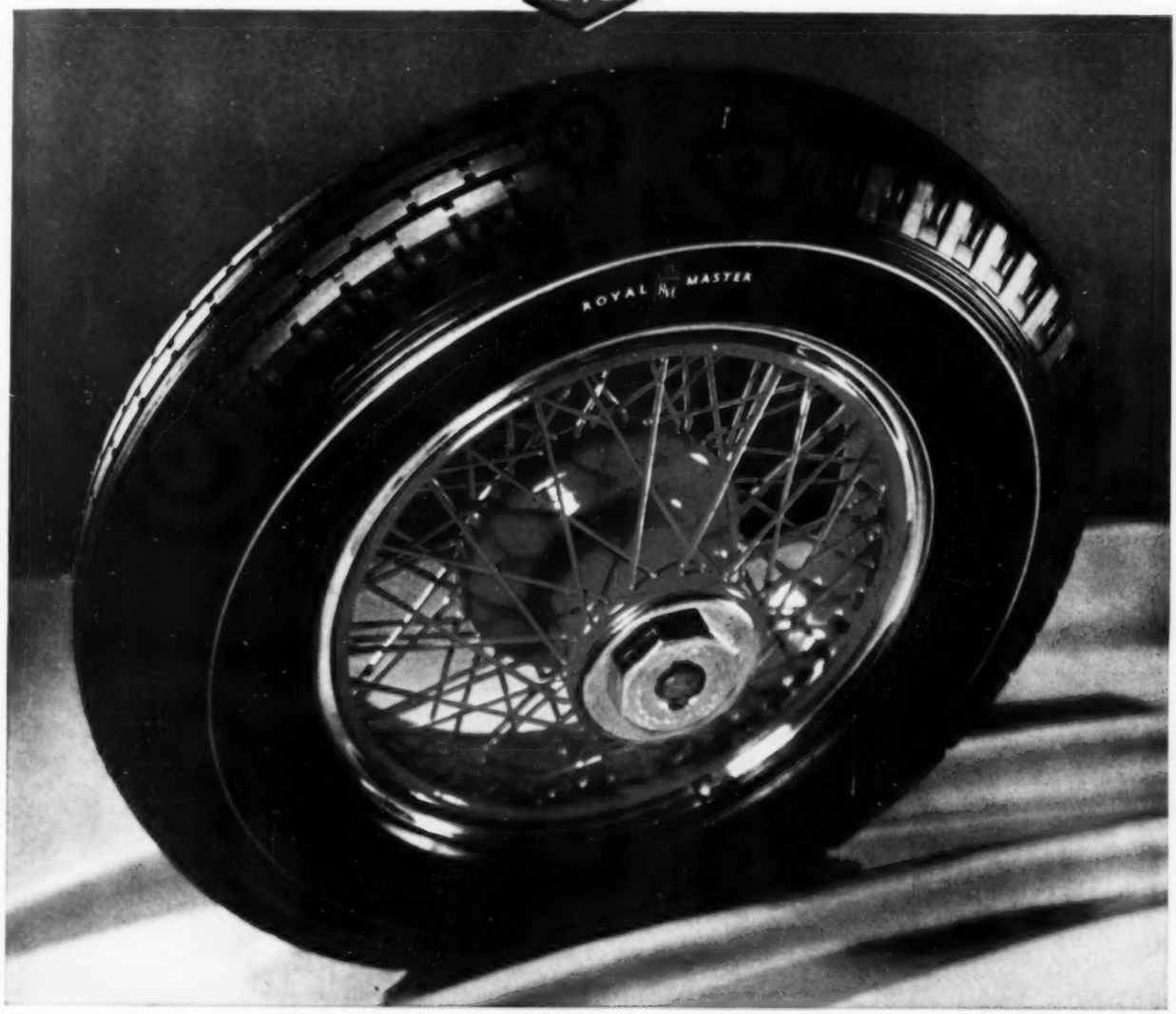
• • •

In March Gillette launched a $10,000,000 advertising campaign, largest in its history. First indication of it was a five-page color advertisement in the *Saturday Evening Post* (circulation: 3,052,082) on March eighth. Followed five-page color advertisements in *Liberty* (2,269,586), *Collier's* (2,094,562), the *Literary Digest* (1,400,000), *Time* (300,000). Followed lesser advertisements in 53 magazines, in newspapers of 203 cities. Abroad, as usual, $2,500,000 will be spent in advertising. But the foreign copy will advertise the old-style razors. It will be at least one year before Gillette is able to manufacture enough new razors to supply its foreign markets. Only the United States, Canada, and Cuba are receiving the new.

• • •

[*Continued on page 132*]

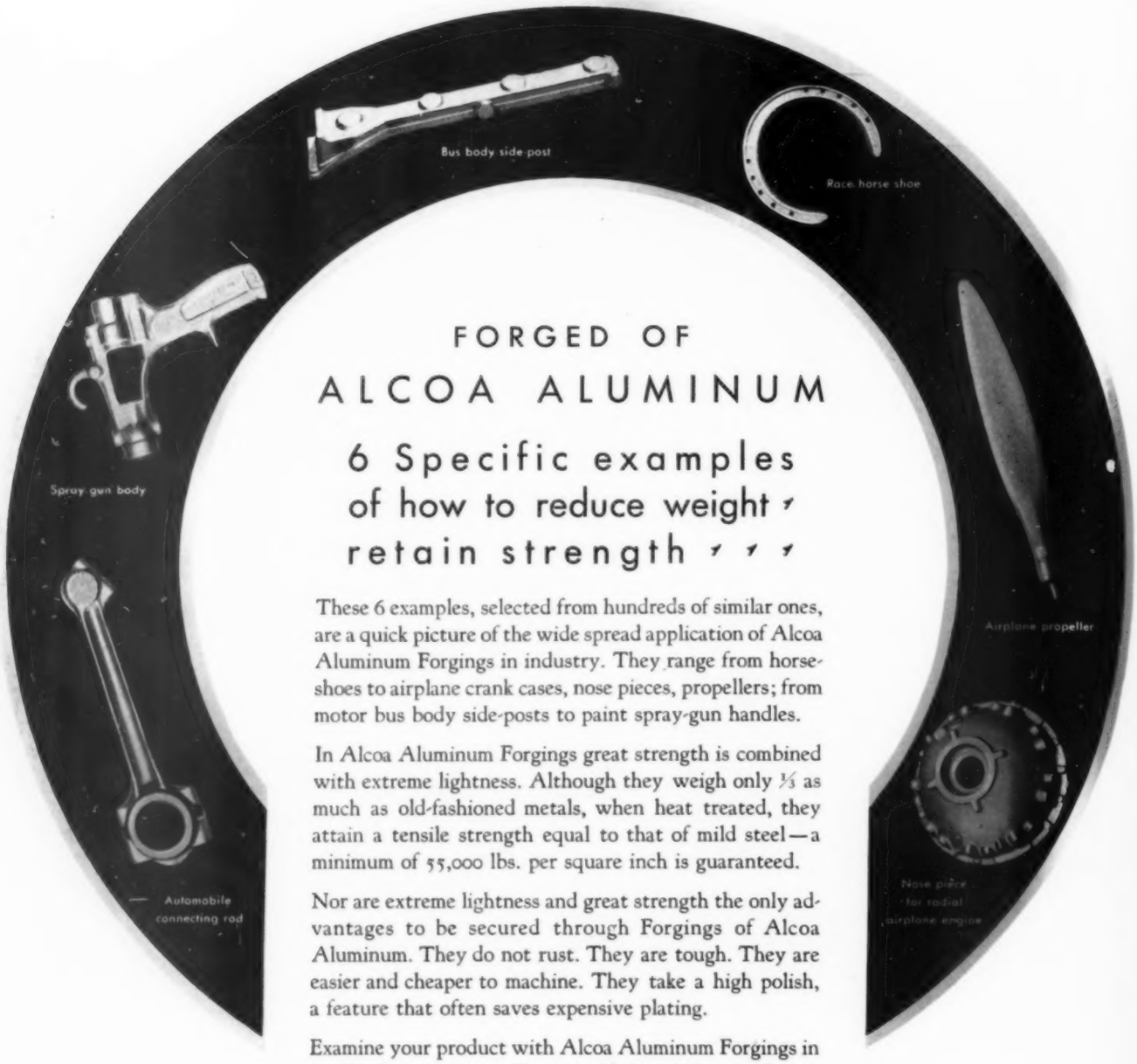
ROYAL MASTER



To install a set of Royal Masters and then forget them . . . to be free from even a hint of tire annoyance as long as they are in your service . . . to know they add beauty to the most princely car as well as security to your every trip—this is the joy of possessing Royal Masters. . . . For those whose means are equal to their inclinations and whose inclinations are for the best in tires, as in all things.

UNITED STATES RUBBER COMPANY

WORLD'S LARGEST PRODUCER OF RUBBER



FORGED OF ALCOA ALUMINUM

6 Specific examples of how to reduce weight ✓ retain strength ✓ ✓ ✓

These 6 examples, selected from hundreds of similar ones, are a quick picture of the wide spread application of Alcoa Aluminum Forgings in industry. They range from horse-shoes to airplane crank cases, nose pieces, propellers; from motor bus body side-posts to paint spray-gun handles.

In Alcoa Aluminum Forgings great strength is combined with extreme lightness. Although they weigh only ⅓ as much as old-fashioned metals, when heat treated, they attain a tensile strength equal to that of mild steel—a minimum of 55,000 lbs. per square inch is guaranteed.

Nor are extreme lightness and great strength the only advantages to be secured through Forgings of Alcoa Aluminum. They do not rust. They are tough. They are easier and cheaper to machine. They take a high polish, a feature that often saves expensive plating.

Examine your product with Alcoa Aluminum Forgings in mind. Our nearest office would be glad to tell you whether your part could be supplied as a forging.

We recommend forgings where there is need for maximum lightness with maximum strength. But the light, strong Alloys of Alcoa Aluminum can be cast in sand, permanent molds or dies at a very low cost. ALUMINUM COMPANY *of* AMERICA; 2402 Oliver Building, PITTSBURGH, PENNSYLVANIA. Offices in 19 Principal American Cities.

ALCOA ALUMINUM

ALCOA

Transactions

Condensations and analyses beneath the headlines of the business news.

MORGAN STOCK POOL ENDS WITH A PROFIT

Who.—Banking group organized on October 24, 1929, with $240,000,000 resources to assist in stabilizing the stock market: J. P. Morgan & Co. (Thomas W. Lamont), First National Bank (George F. Baker Jr.), National City Bank (Charles E. Mitchell), Guaranty Trust Co. (William Potter), Chase National Bank (Albert H. Wiggin), Bankers Trust Co. (Seward Prosser), and Guggenheim Bros. (Solomon R. Guggenheim) . . .

What.—Completed liquidation in open market of securities taken at time of the crash and came out "a little better than even." Amount of profit will depend upon the rates at which interest is figured on the something less than $240,000,000 employed. Funds in excess of that amount were assured but never used . . .

Why.—Sale of securities bought at the bottom of the decline offset losses on stocks disposed of by the group at prices considerably below the prices it paid.

TWO ORIGINAL STANDARD OIL UNITS TO UNITE

Who.—Standard Oil Co. of New York (Socony) and Vacuum Oil Company (Gargoyle), original parts of the old Standard Oil Co. (New Jersey) before antitrust segregation of its units by the courts in 1911 . . .

What.—Directors of the two companies (1928 combined assets, $882,249,828) agreed to combine in General Petroleum Corp. which would be second in oil in America only to Standard Oil Co. of New Jersey (1928 assets, $1,572,267,610). The proposal to merge, however, will be withheld from stockholders pending the outcome of an announced Department of Justice suit to test the legality of the proposed combine . . .

Why.—The two companies do not compete. At home, Standard of New York is chiefly interested in crude production, refining, and marketing of gasoline and kerosene, while Vacuum manufactures and markets high grade lubricating specialties. Abroad is the bulk of Vacuum's business; at home is the bulk of Standard's. Said Standard President Herbert L. Pratt: "The crude supply of the New York company and its refining facilities for gasoline and kerosene will tend to protect and extend the marketing outlets which the Vacuum Company has established for those products."

FROSTILLA GROUP BUYS POMPEIAN CO.

Who.—Syndicate composed of the four Shoemakers of the Frostilla ("Smooths, soothes and protects the skin") Company and Harold F. Ritchie, president of International Proprietaries, Ltd., (Eno's Fruit Salt, Thermogene) . . .

What.—Bought from the Colgate-Palmolive-Peet Company, the Pompeian Company, which manufactures the massage cream ("Clears the skin. Brings healthy color.") called Pompeian. Movie actresses years ago praised it from billboards.

GENERAL FOODS UNITS MERGED

Who.—General Foods Corp., which sells over $100,000,000 of its products (Jell-O, Baker's Cocoa, Log Cabin Syrup, Postum, Maxwell House Coffee, Swan's Down Flour, Post Toasties) every year . . .

What.—Merged three big Boston wholesale packing and food distributing companies (Batchelder & Snyder Co., Arthur E. Dorr Co., and William A. Doe Co.), already owned by its subsidiary, Frosted Foods Products Co., Inc., into one organization to be known as Batchelder, Snyder, Dorr & Doe Co. . . .

Why.—Companies merged, in accordance with General Foods' policy of welding its units together, will serve New England, Eastern New York, and the Atlantic coast states with perishables by the new Birdseye quick freezing process acquired some months ago by the parent company.

24 TO JOIN CLAY PRODUCTS MERGER

Who.—Twenty-four manufacturers of vitrified products such as sewer pipes and power line conduits . . .

What.—Will merge as the Ceramic and Steel Products Co. to be formed in Delaware with $30,000,000 capital, with plants in Ohio, Pennsylvania, Indiana, and Kentucky . . .

Why.—To standardize manufacture.

National Dairy, Kraft Phenix Wedding

Who.—The National Dairy Products Corp., the largest producer of ice cream in the United States, producer also of butter, milk sugar, milk powder, condensed milk, dried buttermilk, casein, and other milk by-products.

What.—Acquired the Kraft-Phenix Cheese Corporation and control of its subsidiary, the Southern Dairies, Inc., to form a consolidation with assets of more than $240,000,000 to which Kraft-Phenix contributes $50,000,000. . .

Why.—The Kraft-Phenix Cheese Corporation has been the subject of many merger reports in the last six months. At one time it was reported that it would be taken into Standard Brands, Inc., later that National City Bank interests were sponsoring a merger of Kraft-Phenix with the Colgate-Palmolive-Peet Company and the Hershey Chocolate Corp. Plans for this latter merger were interrupted by the market break.

THE ITALIAN BANKING MERGER

A SURPRISE ANNOUNCEMENT

Who.—The Banca Nazionale di Credito and the Credito Italiano, which, with the Banca di Roma and the Banca Commerciale Italiana, are Italy's "big four" banks . . .

What.—Merged to form one huge institution, though still not so big as the Banca Commerciale, Italy's largest banking house. The two units will continue under their old names: The merger was carried out under the active personal supervision of Mussolini.

Billion-Mark Merger of German Banks

Who.—Deutsche Union Bank of Berlin, controlled by Kreuger & Toll (Swedish match monopoly) . . .

What.—Merged the Preussiche Pfandbriefbank (capital 25,000,000 reichsmarks)and the Central Boden Kredit A.G., (capital 18,000 000 reichsmarks), two of Germany's leading mortgage banking institutions, into a new bank with one billion reichsmarks ($238,000,000) mortgage bonds outstanding. Name: the Preussiche Central Boden Kredit and Pfandbriefbank.

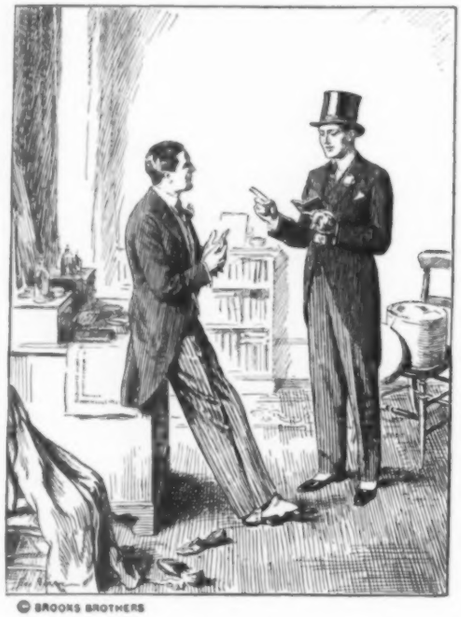
DANZIG MONOPOLY TO SWEDISH MATCH

Who.—The Swedish Match Company (three out of four of all the world's matches burn for it) . . .

What.—Added a match monopoly in the Free City of Danzig to its long list of similar monopolies in Europe and South America by giving Danzig 1,000,000 Danzig gulden, equivalent to about $194,500, certain additional future payments, and a loan of $1,000,000 at 6 per cent. In like manner has the Swedish Match Company obtained most of its many European monopolies.

ESTABLISHED 1818.

Brooks Brothers,
CLOTHING,
Gentlemen's Furnishing Goods,
MADISON AVENUE COR. FORTY-FOURTH STREET
NEW YORK



© BROOKS BROTHERS

Cutaways, Silk Hats
Striped Trousers
for Easter
Spring Weddings
etc.

Send for "A Wardrobe for
FORMAL DAY WEAR"

BRANCH STORES
BOSTON
NEWBURY CORNER OF BERKELEY STREET
NEWPORT PALM BEACH

Wheat Agency Buys to Curb Speculators

Who.—The Grain Stabilization Corporation, company recently incorporated in Delaware with Federal Farm Board backing, and the Farmer's National Grain Corporation, also Farm Board sponsored . . .

What.—Purchased between 6,000,000 and 12,000,000 bushels of May wheat futures in the open market during the recent collapse in wheat prices . . .

Why.—The Federal Farm Board had directed the National Corp. to buy wheat from coöperatives only at the preferential rate (ten to fifteen cents higher than Chicago Board of Trade quotations), and the Stabilization Corp. to buy "trader wheat" in the open market at the cash wheat price. This had the effect of "averaging down" the cost of the total wheat purchases and at the same time of taking May futures off the market so that the corporation would not be in the position later of having to pay higher cash prices for the grain delivered under these contracts.

PAN-AMERICAN LINE TO GET RIO AIR MAIL

Who.—Pan-American Grace Airways, Inc., joint subsidiary of Grace Steamship Co., and Pan-American Airways, Inc., which is in turn controlled by the Aviation Corporation of the Americas. Pan-American Grace planes fly from Miami to Cristobal, thence down the west coast to Santiago and over the Andes to Buenos Aires. Soon they will fly up the east coast from Buenos Aires to Montevideo and Rio de Janeiro . . .

What.—Will get the bulk of a supplemental Post Office Department budget estimate of $1,500,000 for extending foreign air mail service in South America from Buenos Aires to Rio . . .

Why.—This is the question the recently inaugurated New York, Rio & Buenos Aires Lines, Inc., contending its lines are more direct, will ask in its protest, probably through its Board Chairman, one-time Assistant Secretary of Commerce in Charge of Aeronautics, W. P. MacCracken Jr.

GOODYEAR TIRE CONTROL GOES TO C. S. EATON

Who.—Goodyear Tire & Rubber Company, the world's largest manufacturer of rubber . . .

What.—Passed into the hands of a group headed by the banking house of Otis & Company, whose chief partner is Cyrus S. Eaton of Cleveland. Analagous to the recent Otis Eaton merger of independent steel companies would be a consolidation, under the same auspices, of two more tire and rubber companies.

Why.—Since 1928, American rubber companies have seen the need of a closer organization of the industry. Their difficulties go back to November, 1922, when the British Empire, producing 67 per cent of the world's rubber supply, saw opportunity to establish world monopoly and fix world price at between thirty and forty cents a pound. For a time the Stevenson Restriction Act was as successful as Britons hoped it would be. Prices soared as high as $1.21 a pound. American rubber manufacturers, alarmed, formed the American rubber pool and purchased vast stocks at prices ranging from thirty-five to forty-one cents a pound. Meantime Dutch and Javanese planters in the Dutch East Indies had been watching the prices. In 1927 they produced 225,000 tons of rubber, ending British monopoly control of world prices. Prices dropped in February, 1928, kept dropping to 17.2 cents in April. American tire companies took staggering losses on their inventories. Profits sagged into deficits.

More immediate troubles have been competitive—with mail order houses and each other. Many companies are building, or plan to build, chains of master service stations, supplying the motorist with gas, oil, tires, batteries, etc. Consolidations of tire companies into larger units would prevent competition from becoming ruinously expressive.

"SUCCESS in Overseas Selling..."

SAYS DR. JULIUS KLEIN

DR. JULIUS KLEIN
Assistant Secretary of Commerce

"requires something more than daring and dominant will ... precision of information is of paramount importance for every Merchant or Manufacturer, Banker or Shipper."

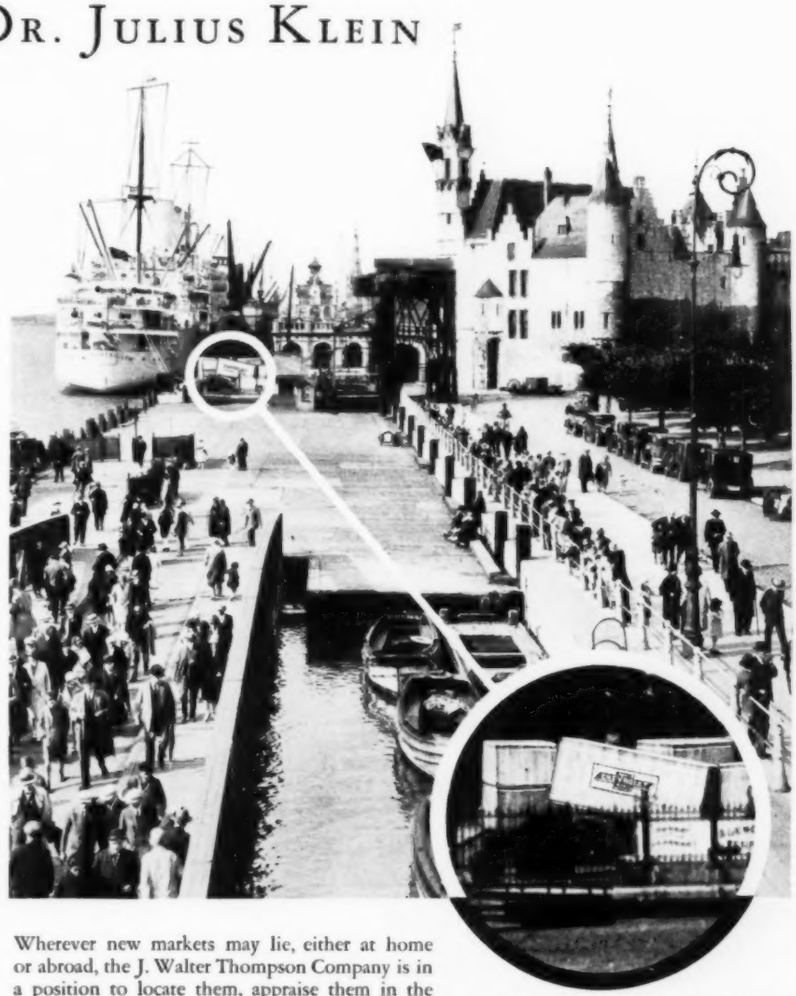
DR. KLEIN'S statement goes to the root of the selling problem here and abroad.

In the depression of 1920, to dispose of a temporary surplus, many American manufacturers sought foreign markets as an easy means for clearing their warehouses.

The farsighted manufacturer, however, looked at new markets overseas in the same way as he looked at new markets in America—as a field requiring for its development a merchandising strategy built on the solid basis of precise information, gathered through intimate familiarity with the habits and customs of the potential users of his product.

The J. Walter Thompson Company commenced, more than ten years ago, to build an organization which would give American manufacturers, in their penetration of foreign markets, the advantages of those same American merchandising methods which the J. Walter Thompson Company has applied so successfully in this country.

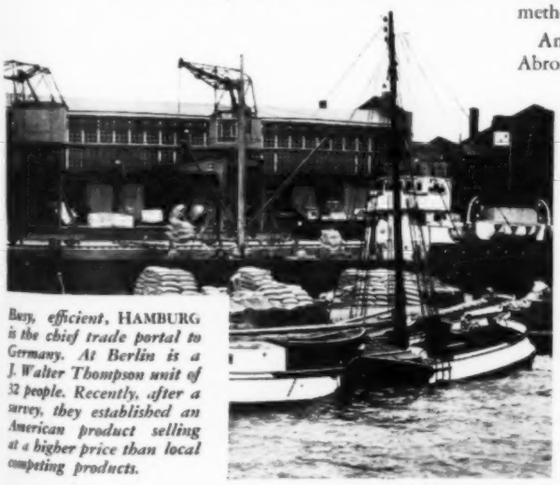
As a result of this planning years in advance, the J. Walter Thompson Company has a seasoned organization comprising 16 fully equipped main offices and 13 branch offices, assuring clients of a service in foreign fields which complements the service of the Company in the domestic market.



Unloading American products at ANTWERP. *To speed their distribution the Antwerp Office of the J. Walter Thompson Company employs a staff of thirty-six people. Among them they command fifteen different languages spoken in the territory this office covers in its market research and advertising work.*

Wherever new markets may lie, either at home or abroad, the J. Walter Thompson Company is in a position to locate them, appraise them in the order of their importance, and cultivate them with methods of proven efficiency.

An interesting pamphlet, entitled "Selling Abroad," which shows the scope of the foreign service of the J. Walter Thompson Company, will be gladly sent to executives interested. Write to the New York Office and a copy will be mailed to you promptly.

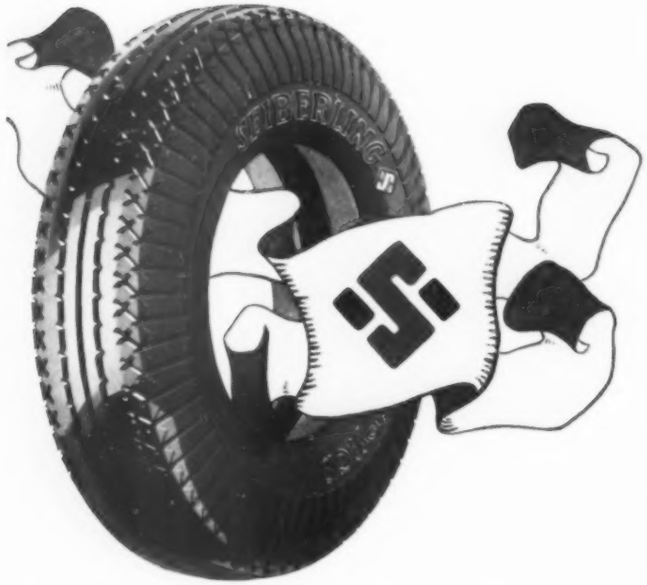


Busy, efficient, HAMBURG *is the chief trade portal to Germany. At Berlin is a J. Walter Thompson unit of 32 people. Recently, after a survey, they established an American product selling at a higher price than local competing products.*

J. Walter Thompson Company

New York • Graybar Building • 420 Lexington Avenue

Chicago, Boston, Cincinnati, San Francisco • Montreal, Canada • Paris, London, Madrid, Berlin, Stockholm, Copenhagen, Antwerp, Warsaw • Alexandria, Egypt; Port Elizabeth, South Africa • Buenos Aires, Argentina; Sao Paulo, Brazil • Bombay, India • Sydney, Australia,



GREAT ALWAYS . . .
GREATER NOW

For more than 30 years, the Seiberling name has signified unresting improvement, enterprise, invention—and always unchallenged integrity. Now, at the beginning of 1930, the sources of this generation-long renown are reflected more clearly than ever in the latest Seiberling product. . . . No less than six major advances, in manufacturing process, in selected raw materials, and in improved design, signally distinguish the new Seiberling Special Service Balloon Tire. From tread to bead, it is the exclusive quality result of Seiberling experience, progress, and ideals. . . . As such, it is not susceptible of comparison by any other tire standards. There is no like—but only contrast. . . . The Seiberling Rubber Company, Akron, Ohio.

Seiberling

[*Continued from page 116*]

U. S. APPROVES BIG NORTHWEST RAIL MERGER

Who.—The Interstate Commerce Commission . . .

What.—Approved the unification of the Great Northern and Northern Pacific railroads, but refused to include the Chicago, Burlington & Quincy in the combination. A holding company, the Great Northern Pacific Railway Co., will take over control of the Northerns. The Commission's decision reverses that of the Supreme Court in the famed Northern Securities case of 1901 . . .

Why.—The I. C. C. decision logically follows publication, last December, of the Final Plan for railroad consolidation, in which the Northerns were united, the Burlington was divorced.

MERGER OF FIDELITY TRUST INTO MARINE MIDLAND ANNOUNCED

Who.—The Marine Midland Corporation, which owns 94 per cent of the stock in seventeen banks in New York State with resources of more than $534,000,000 . . .

What.—Acquired Fidelity Trust Company of New York, total resources $76,911,854 . . .

Why.—To have one member of its group of banks in Manhattan.

National Brands Formed Under Delaware Laws

Who.—National Brands, Inc., a new food holding company organized along the lines of Standard Brands, Inc., General Foods Corp., etc., with A. Victor Hughes (Crosby & Hill Co., Wilmington, Del.) as President . . .

What.—Bought the Quaker Products Company of Philadelphia (Quaker Oats) and planned to buy the American Dairies Company of Detroit.

Rossia Acquires 3 Germania Group Units

Who.—The Rossia Insurance Company, a reinsurance company organized in 1919 to succeed to the business of the United States branch of the Rossia Insurance Company of Petrograd . . .

What.—Acquired control of the Germania Insurance Company of 1922, the Germania General Life Insurance Company, and the Germania Accident and Third Party Insurance Company for approximately $3,102,000. Recent cables from Frankfort-on-Main stated that control of the Germania group, said to be one of the largest insurance companies in Germany, was purchased from Jacob Michael by Paine, Webber & Co., of New York, for the Globe Underwriters Exchange, Inc., of New York.

STONE & WEBSTER PLAN MERGER WITH LARGE UTILITY FIRM

Who.—Stone & Webster (Charles Augustus Stone, Edwin Sibley Webster), Inc. Utility enterprises and subsidiaries under its supervision serve more than 5,000,000 Americans, Canadians, West Indians with light and power . . .

What.—Proposed to acquire the Engineers Public Service Company (gross earnings 1929, $50,494,852). Its lines and plants, already under Stone & Webster supervision, serve 2,300,000 people in 528 communities in 12 states, Southern, Southwestern, Rocky Mountain, and in the city of Ponce, Porto Rico . . .

Why.—Acquisition of Engineers Public Service may mark the beginning of a new plan of organization by Stone & Webster. In the future it will plan to control those affiliated and connected organizations in which it now has a minority interest.

THE BANK DISCOVERS A POWERFUL BUILDER OF GOOD-WILL

• NO LONGER are bank executives cold, aloof figures, guarded by closed doors and supercilious secretaries. Their desks, today, are in plain sight, accessible to all. • In line with this new policy, another instrument for the building of good-will has emerged. To each depositor of certain progressive banks there comes, once or twice a year, a letter from the office of the President. It is typewritten, and personally signed by the head of the bank. It outlines a service, states a policy, establishes a sense of close relationship and confidence. • To be successful, such letters must be genuine in every sense. It is significant that in many cases the background given them is the clean, crisp integrity of Coupon Bond—recognizable at a glance, at a touch, as worthy of respect. • It is chosen for the same qualities that have made it the executive stationery of business leaders throughout America. • Coupon Bond is a supreme achievement in paper making. It is manufactured, 100 per cent, from strong, new rags. And its Eagle-A watermark is a nationally accepted symbol of excellence. • Our portfolio, "The Modern Trend in Letterheads," and a new booklet, "The Executive Letter," will be sent you on request. (In writing for them, please use your business stationery.) ¶ *Coupon Bond is but one paper in the Eagle-A Line of Bonds, Ledgers, Writings, Index Bristols, Offsets, Covers, Book Papers, Mimeograph and Manifold Papers—the* right *paper for every business purpose.*

AMERICAN WRITING PAPER COMPANY, INCORPORATED
HOLYOKE, MASSACHUSETTS

EAGLE·A·PAPERS

"The Longest Gangplank in the World"

from the heart of Manhattan to Le Havre de Paris

Main foyer "Ile de France"

Five and a half days to Plymouth

"Paris"
April 11 - May 2

"Ile de France"
April 18 - May 15

"France"
Mediterranean-Carthage Cruise
April 25

"De Grasse"
April 23

"Rochambeau"
June 7

"Lafayette"
May 31

FRANCE in miniature, given wings below the waterline . . . that's every French Line ship... the chic of the boulevards, the gayety of the cafés and dance places, the thrill of the shops, the elegance of the *ancien régime*, the electric modernity that sets a pace for the world . . . all here, in the stately salons, the broad white decks, the marvellous suites and cabins ⟷ The cuisine is Paris, too, in flavor as in name . . . the service anticipates every wish... Breton seamen whose ancestors tamed the Atlantic in the fifteenth century swing their modern miracles of speed and luxury from New York to Plymouth and le Havre ⟷ The "*Ile de France*," the "*Paris*" and the "*France*" maintain Weekly de luxe Express Service ⟷ The "*Lafayette*," the "*De Grasse*" and the "*Rochambeau*" form a cabin fleet that makes economy smart.

French Line

Information from any authorized French Line Agent or write to 19 State St., New York

The Texas Corporation

[*Continued from page 30*]

yield and 48.3 per cent yield is a difference of 4⅓ gallons of gasoline to every 42-gallon barrel of crude, a superiority in refining is one obvious reason for a superiority in net income. Despite the necessity of utilizing all the by-products of petroleum (and no company is more alive than the Texas Corporation to the importance of lubricants or the possibilities of natural gas), the petroleum refiner inevitably thinks first of petroleum in terms of gasoline and of efficient gasoline extraction as the cornerstone of his business.

"We followed reluctantly"

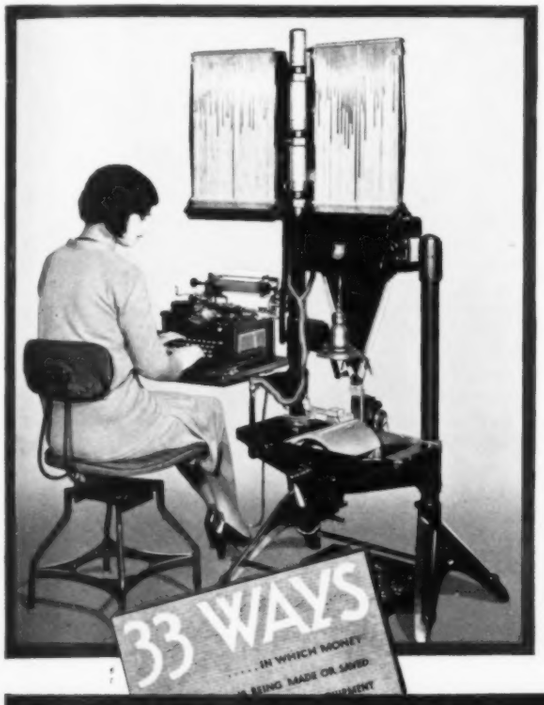
Mr. Holmes personally is conservative, determined, averse to publicity, and minus spectacular peculiarities or hobbies. Oilmen belong among those captains of industry who are still emphatically in the saddle and do not have much time to go in for sunken gardens or floating palaces. From a professional standpoint, Mr. Holmes is widely known as an outstanding conservationist. In March of the present year, following a price-cutting movement inaugurated by Standard companies, Mr. Holmes issued a statement giving his views on petroleum's perennial overproduction problem. Arguing that "we are in a period of chronic overproduction, quite different from overproduction situations we have had in the past where the oversupply brought about price conditions that discouraged new activities," Mr. Holmes estimated the crude stored above ground at more than 500,000,000 barrels with "shut-in production running as high as 1,200,000 barrels daily in the United States and 800,000 barrels in other countries." Texas and California were pointed out as the two states most responsible for overproduction, and the restricting of Texas and California output to their 1928 levels as the best method of correcting the oversupplied condition. But, added Mr. Holmes, "We were among the last of the large purchasing companies to meet the recent price reduction and followed reluctantly . . . We believe that the general spirit of coöperation within the industry that was and is followed by the producers should have influenced the principal purchasing companies to attempt to maintain crude prices until the coöperative movement had received every possible opportunity of succeeding." Thus, independently, spoke the Texan independent.

Allegiance to itself

There is a story (not officially vouched for) that the Texas Corporation was once on the point of placing its advertising through an agency that is one of the largest in the country. Then, recalling its tradition of independence, Texas decided to remain with the relatively small agency that still efficiently advertises its Texaco products. Whether or not this story is true in fact, it is true in spirit. The Texas Corporation is independent in more than the technical sense of never having belonged to the Standard Oil group. In the neighboring Gulf company there is a tradition of family pride, a tradition to which the Mellons themselves subscribe so fully that they will drive blocks out of their way to get that "good Gulf oil." But Texas has an allegiance only to itself. The absence of a banking control and the diversification of stock has already been mentioned. Many petroleum prophets see the petroleum industry of tomorrow combined into a few great integrated systems, predict that only through many and far-reaching consolidations can the industry be stabilized. That there are too many producers is obvious enough, as is also the fact that the oil fields offer many merging opportunities. But if the industry does develop into a few great systems, it is safe to say that the Texas Corporation will be in a center and not on a circumference. It is impossible to visualize the Texas Corporation as entering any consolidation in which its independence and individuality would disappear.

During 1929 the Texas Corporation reached a net of $48,318,072 compared to its 1928 net of $45,073,879. Although in nearly every industry 1930 is expected to show an earnings' recession, it must be remembered that coal and steel are hardly more basic than petroleum. In the Texas Corporation's Manhattan office hangs a chart showing that the motors of privately owned automobiles constitute 70 per cent of "prime movers" (any source of horsepower including steam and electricity). As this comes close to 85 per cent with the addition of busses, gasoline engines, and other users of gasoline, it will be seen that the industrial age moves largely under petroleum's power.

The SET-O-TYPE adds a bonus to your MULTIGRAPH profit



A thirty minute job of Multigraph typesetting becomes a five to eight minute job with the Set-O-Type. Time saved—80 per cent; cost saved—50 per cent!

Any office that has occasion to use a reasonable amount of composition for letters, bulletins, house organs, and similar material will find that gains credited to the Multigraph can be greatly enlarged by gains in time and money made possible by means of the Set-O-Type.

Any typist familiar with the standard typewriter keyboard can set type with this speedy machine as rapidly as she can do ordinary typewriting. Type distribution is eliminated. Clean, fresh type is used for each job. Ask for a demonstration.

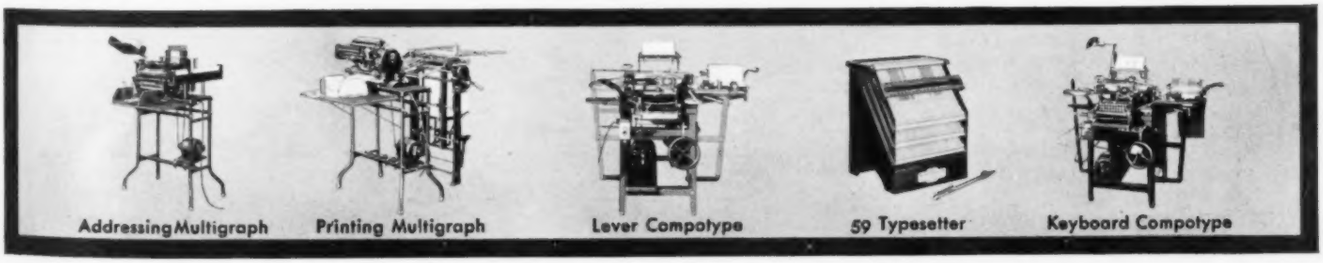
THE AMERICAN MULTIGRAPH SALES COMPANY
1834 EAST 40th STREET CLEVELAND, OHIO
(or consult your city telephone directory)

• • •

DO YOU KNOW YOUR MARKET?

We have developed Multigraph equipment to meet the special requirements of today's conditions which put a premium on selective selling.

— The MULTIGRAPH Line —



"WIRE ME CARE OF S.S. MAJESTIC"

MANY an executive leaves this message with his office on the eve of sailing for Europe on the world's largest ship. The steamer sails from New York at the week-end and our executive keeps his appointments in London or Paris the following week-end.

At the end of the run he is toned up physically and mentally ...has cleaned up a mass of business details. Much dictation is out of his system; the special brokerage service now installed on the *Majestic* has kept him constantly in touch with the market, and through the ship's radio service he has followed business developments at home. Every trace of the tired business man is gone.

You, too, will like traveling on the *Majestic*, the world's largest ship. In addition, we offer executives, for their frequent crossings, such famous liners as the *Olympic*, *Homeric*, *Belgenland*, *Minnewaska*, *Minnetonka*, and many others.

Weekly sailings to the principal British and north European ports.

30 Principal Offices in the United States and Canada. Main Office, No. 1 Broadway, New York City. Authorized agents everywhere.

WHITE STAR LINE
RED STAR LINE
ATLANTIC TRANSPORT LINE
International Mercantile Marine Company

Petroleum

[*Continued from page 48*]

Thus the Producer, but quick is the Refiner's reply. In the first place, the Refiner thinks that the Producer is putting altogether too much emphasis upon those 53,000,000 barrels of net import. Even if there were no imports, and the 1929 ratio of production and consumption were maintained, it would take years to exhaust the present surplus. Besides, even if the two Standard companies and Gulf stopped importing Venezulean oil, would such a concession prevent importation? Would not Royal Dutch-Shell (the world's largest producer of petroleum) still bring in huge quantities? Possibly a tariff wall would keep out imported oil (some of the independents were in Washington last month looking for such protection), but as long as the three American companies with the most important foreign holdings are competing with Sir Henri in world trade, they are likely to keep their cheap foreign production running at capacity. Besides, even the entire gross imports for the year hardly equal the output of a good-sized American field.

Restriction in 1929

Furthermore, says the Refiner, the yearly 1,005,000,000-barrel production figure which the Producer uses to establish the claim that there is no overproduction is not a sound figure because it represents a restriction in nearly every production to which restrictive measures have been vigorously applied. Throughout 1929 there was more or less restriction in nearly every representative field, so that the 1929 production figures by no means represent the total that would have been reached if every well had been allowed to run at capacity. Restriction agreements vary widely in different fields and are adopted for periods ranging from a month up, so that the 1929 production under wide-open methods cannot be accurately determined. At a conservative estimate, however, the difference between actual and capacity production would easily total 300,000,000 barrels and might run many millions higher. So the Producer is using a restricted figure to argue that restriction is unnecessary.

Less barrels, more dollars

And, finally, the Refiner maintains that when the Producer complains about restricting his output, he must also admit that from this restricted output he gets a higher price per barrel. In 1926, for example (the last year in which domestic production plus net imports failed to equal demand), production was 771,000,000 barrels, and the average price per barrel was $1.88. In 1927, when new fields raised production to 901,000,000 barrels—a surplus even without imports—the average price per barrel fell to $1.30. The earnings of the big integrated refining companies also showed a pronounced dip. To be sure, it is very difficult to convince the small Producer who is just about keeping his head above water by running all his wells at capacity that the increase in price will compensate for his lessened output. It is even more difficult to convey this idea when the Producer knows that he has to sell his crude to the Refiner and that if he does not limit his production the big Refiner may try price-cutting as an added persuasive method. It is true, however, that less barrels per acre mean more dollars per barrel.

• • •

Meanwhile it is obvious enough that the Refiner is the controlling factor in the industry. It is in the nature of the business that this should be so, and it has been so ever since the point became apparent to the keen intelligence of old John Davison Rockefeller, who did not worry about who produced the oil as long as he refined and sold it. The Producers are to the Refiners much as the farmers are to the manufacturers. They are more numerous and less prosperous and not extremely capable of united action, and they have a strong tendency to forget their troubles, and the underlying causes thereof, whenever a rise in prices brings a temporary affluence. It should be added, however, that the farmer does not live in dreams of sudden wealth, whereas the Producer is frequently thinking of striking another Spindletop or bringing in a new Seminole Field. His attitude is romantic and courageous, and the very littlest Producer, the wildcatter, is the man who has brought in the majority of the big fields and gushers. But his is an attitude that is not always conducive to such a condition of stabilization as an industry so basic as petroleum demands.

THIS IS ONLY A STARTER

Fire . . confusion . . ruins . . insurance policies . . claim adjusters . . prompt payment of the loss

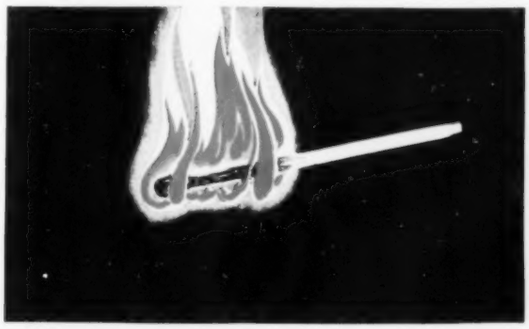
. . . ***AND THEN WHAT?*** Your fire insurance, let's say, is sufficient to meet your loss of physical property. No complaint on that score. Rebuilding can start at once : : But what about your loss of business income . . . while your factory or store or apartment is out of business? : : Where would a fire leave you on unfilled orders, salaries to employees, taxes, bank obligations, interest on bonds, income from tenants?

Fire is a terrible thing—but fire is only a starter. Good fire insurance will bear the brunt of your property loss, but unless it is so written as to cover your business income loss also you are courting disaster.

There's a Hartford agent* near you who can show you how to carry your insurance protection beyond the mere replacement of property—so that it guarantees an income while your property is being replaced. It's good business to protect income as well as the property that produces income. It may mean the difference between business safety and bankruptcy : : Your case needs expert study—and the application of *individualized insurance.* The Hartford agent is an experienced insurance man—backed by a well-managed stock fire insurance company financially able to meet any drain made upon it.

THE HARTFORD FIRE INSURANCE CO.

AND THE HARTFORD ACCIDENT AND INDEMNITY COMPANY



WRITE PRACTICALLY EVERY FORM OF INSURANCE EXCEPT LIFE

***If you do not know the name of the Hartford agent look under "Hartford" in your telephone book. If he isn't listed write the Hartford Fire Insurance Company, Hartford, Connecticut.**

© H. F. I. CO. '30

"Get the Police, *Quick*, We've been robbed!"

THE EMANCIPATION OF THE AMERICAN BUSINESS MAN

THEN he phones his insurance agents. His protective associations. His bank. His partners or directors . . . Instantaneously, he sets into action the *organized* forces of society at his disposal. He does not call in the man across the street. Or the policeman on the beat. Or a casual acquaintance. He does not waste precious time on individuals. For even the loss of a few hundred dollars commands the attention of the powerful, coordinated machinery of law and order. But what is a man to do when his physical inventory shows an unexplained loss of *thousands* of dollars? Where can he turn for help when profits vanish into thin air? When the wasted time of employees mounts into dangerous sums? When disorganized, unrelated business systems rob the treasury?

This is what he does, if he is a logical, keen-minded man . . . He turns to the largest organization of its kind in the world for protection. He sets in motion a business force, never before available, to preserve his profits. He gets quick, concerted action from the trained minds and the priceless experiences of 4,000 men . . . The best informed men in America on creating, filing, and protecting control-records of business.

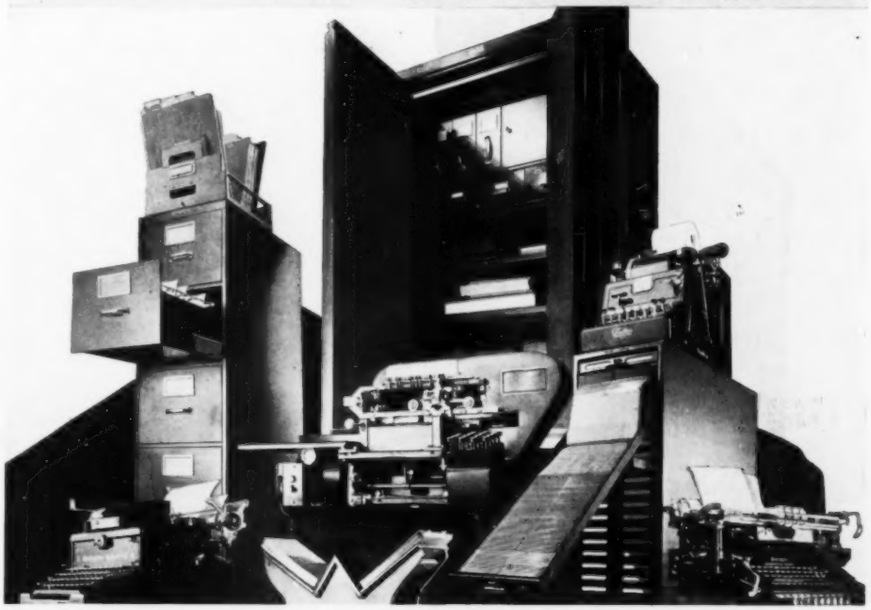
For Remington Rand has welded together an organization that prevents more business losses every day than the sum of a year's robberies! That fights waste of time and effort with the directness that comes of complete understanding of economical business systems. That can tell you, sometimes even before a survey, where you can plug the leaks and losses that may be draining your business of its life blood.

The prevention of losses is but one of the many advantages that come to you from these leaders in the development of modern office and control equipment. The killing of details en masse, the freedom to think and plan, the clearing of your business vision, the new sense of direction that comes with complete control of records . . . Remington Rand brings you what you lack and what you need, no matter how chaotic your present business systems may be.

Why not make certain?

Never before has there been such a pooling of specialized abilities. Never before have business men been able to turn to such a wealth of authoritative information. Now, Remington Rand can and will send an expert in any business system to see you at your request. If he does not have the answer to your situation, he can call upon 4,000 associates for their own special advice and counsel. Big business or small business, the service is at your disposal. Unbiased. Accurate. Helpful.

THE GREAT EMANCIPATORS



Remington Rand

BUSINESS SERVICE

REMINGTON *Typewriters and Accounting Machines* . . . LIBRARY BUREAU *Filing Systems and Indexing Service* . . . RAND & KARDEX *Visible Records* . . . SAFE-CABINET *Record Protection Devices* . . . INDEX VISIBLE . . . POWERS *Accounting Machines* . . . DALTON *Adding & Bookkeeping Machines* . . . KALAMAZOO & BAKER - VAWTER *Loose Leaf Equipment* . . . *Executive offices, Buffalo, New York. Sales offices in all leading cities.*

There is No Transportation Problem

That Cannot Be Solved More Economically with a WHITE

The tremendous annual investment in transportation has placed a major responsibility on the shoulders of those who purchase motor equipment. Transportation affects the cost of both production and distribution and low costs in both branches of business depend on low cost transportation.

The low transportation cost of Whites exists whether the operation calls for one truck or a fleet of one thousand.

In order to serve the existing and future

requirements in every field of motor transportation, White builds the most complete line of quality trucks and busses in the industry. Additions to the White line are made when new models can fill a definite place in the requirements of modern transportation.

The new White Six-Cylinder models clearly demonstrate a progressiveness that assures the most advanced units of transportation at all times.

This policy has proved to be the soundest contribution that has been made to motor transportation. It has meant honesty and fearlessness in recommending and selling transportation to the large or small operator. It has enabled White to promote the proper use of transportation facilities above the sales of any one model.

The broad scope of White service—the intelligent application of White Trucks and Busses to the operator's requirements has resulted in savings to operators that run into many millions of dollars. It has pointed the way to lower costs in package and bulk hauling. It has increased areas of distribution—relieved terminal congestions and has advanced the handling of mass crowds and intercity highway travel.

This experience, this well earned leadership of over 25 years, has a tangible meaning to any purchaser of a truck or bus. It removes any question of quality or price and assures him the greatest return for his transportation investment.

The Most Complete Line of Quality Trucks and Busses

LIGHT DELIVERY

WHITE MODEL 60 — Six-cylinder. Four-wheel hydraulic brakes. Latest features to assure ease of steering and driver comfort. The last word in speed, power, flexibility, [illegible] ability and low per-mile cost.

WHITE MODEL 15-B — Four-cylinder. No other truck of like size and capacity compares with it for low operating cost, dependability and performance over hundreds of thousands of miles.

LIGHT DUTY

WHITE MODEL 20-A — 1½-ton. Four-cylinder. Sets the standard for dependability, long life and low cost. Four speeds forward.

WHITE MODEL 61 — The Light Duty Six. Capable of higher average speed on all routes. Four-wheel hydraulic brakes. Four speeds forward.

WHITE MODEL 37 (Special) — 1½-ton. Four-cylinder. Has extra power and speed to meet harder delivery schedules, city or intercity. Four speeds.

FAST EXPRESS

WHITE MODEL 56 — 2-ton. A fast truck, capable of long daily mileage under capacity loads. Serves efficiently for years after ordinary trucks fail.

WHITE MODEL 51-A — 2½-ton. Unmatched performance for heavier loads and faster distance runs in a wide variety of fields. Remarkable power, dependability and low operating cost.

HEAVY DUTY

WHITE MODEL 58 — High speed, powerful Heavy Duty with gross weight capacity of 22,000 pounds. Capable of handling more pay loads at lowest operating cost.

WHITE MODEL 55 — 3½-ton. Equipped with White's exclusive double-reduction gear drive, extremely rugged, efficient, economical. Various types of dumping bodies and hoists are available.

WHITE MODEL 52 — Heavy Duty. Has White's exclusive double-reduction gear drive. Auxiliary low gear provides extra pull. Various dumping bodies and hoists available.

WHITE MODEL 59 (Special) — New, high-speed, six-cylinder tractor or truck for city or long-distance hauling of extremely heavy loads. Particularly adaptable to unusual hauling requirements.

BUSSES — Fours and Sixes

WHITE MODEL 53 — Four-cylinder, 16-passenger. Proven reliability and economy.

WHITE MODEL 65 — A six-cylinder bus. 18-21-passenger. Outstanding performance distinguished by remarkable smoothness and flexibility.

WHITE MODEL 50-B — Four-cylinder, 25-passenger. Westinghouse airbrakes. Adaptable for city and suburban work.

WHITE MODEL 54 — Six-cylinder, 29-passenger. Westinghouse airbrakes. Has demonstrated its ability to outperform all heavy duty busses.

WHITE MODEL 54-A — Six-cylinder, 38-41-passenger. Westinghouse airbrakes. Maximum capacity combined with maneuverability. Ideal for heavy city and suburban service.

THE WHITE COMPANY, CLEVELAND

WHITE

A COMPLETE LINE OF FOUR AND SIX CYLINDER

TRUCKS
BUSSES

So many apparently unimportant letters often acquire a sudden importance that a great many firms prepare for this . . . by standardizing on the finest letterheads they can buy, for *all* their correspondence.

CRANE'S
BOND
for letterheads and envelopes

Crane's Bond—a 100% new white rag paper—carries an unfailing impression of dignity and standing. Crisp, sturdy, important—it is a paper to build prestige and good will among your letter contacts. To be sure, it costs a little more than an ordinary good paper—but that little is an incontestably sound investment.

CRANE & CO., Inc.
DALTON · MASS.

Eating and Drinking the Imperial Dinner

[*Continued from page 63*]

guest's ability to judge wine.

Preparation of the wine began six hours before the feast. Two hundred magnums of Pommery and Greno were set to cool, and of Lafite twelve precious jeroboams (double magnums) were opened by drawing off their slender necks with red-hot tongs. A corkscrew, even in the most expert hands, might have stirred the sediment which underlies all great and old red wine. Moreover, the cork of a wine sixty-five years old can scarcely ever be drawn whole, but cracks and crumbles, thus defiling with bits of cork the precious fluid. There is also the risk that handling will break the huge fragile jeroboam, traditionally the proper receptacle for the aging of any great wine. (Professor Saintsbury still mourns the two he spectacularly lost when his terrier chased a rat between them in his cellar.) By all odds hot tongs are safest. After they had been applied, each jeroboam was tenderly divided between two decanters, these being allowed to stand for six hours in order to assume the room temperature at which they would be drunk.

To crown the Imperial Dinner with liquid gold, Mr. Reeves-Smith naturally chose the dessert wine which rapturous Frenchmen call "l'Or du Soleil en Bouteille et l'Extravagance du Parfait!" Produced and bottled solely at the château of Monsieur le Marquis Bertrand de Lur Saluces (an extremely likable young bachelor who spends most of his time either yachting or writing the history of Russian literature in Russian, which he has learned as a hobby), the peerless Château Yquem has been described by Mr. Reeves-Smith as "the rarest and richest, the sweetest and most wonderful white wine known to man."

Almost everyone, including women and Japanese, likes this costliest of wines. But it is so rich and voluptuously full bodied that even a glutton cannot take much of it without feeling too full.

Port from Portugal at the close of a dinner is as axiomatic to an Englishman as sherry from Spain with the soup, and 1904 port was chosen for the diplomatic reason that it is the "greatest vintage year of port in *this century*."

Asked the reason for his last choice, George Reeves-Smith said with a smile as bland and cheerful as rare old Lafite:

"Perhaps it may be necessary to offer reasons for producing a seventy-five-year-old brandy, but I do not know that any are necessary."

"The King!"

Of the five hundred guests only three passed so much as a single dish of the eight courses prepared by fifty chefs and served by one hundred and ninety waiters.

The twelve jeroboams of Lafite were ample. Of the two hundred magnums of champagne placed on ice, one hundred and fifty were poured by twelve cellarers, with the Japanese in magnificent fettle.

Some fifty guests figuratively wrote the name of their favorite drink in the empty space at the top of the menu—that is to say, they demanded cocktails.

Whatever he may have meant by it, Signor Zavatonni, maître d'hôtel of the Savoy, said: "Even louder than the French and Italians in praising the wine were the Americans." But General Dawes did not break his inflexible ice water rule, nor did Secretary of the Navy Adams. Mr. Morrow sipped the wines of his usual choice with his usual moderation. Ambassador Gibson, who has now resided abroad almost continuously for some twenty-five years, drank like a European, that is, with gusto and appreciation. No one seems to have noticed what Senators Reed and Robinson drank on this particular occasion.

The chief of the American Delegation, Secretary of State Henry Lewis Stimson, indicated to the cellarer at his elbow that he wished both Lafite and champagne. When these were poured, he responded to a private toast pledged him by Prime Minister James Ramsay MacDonald in Lafite with Lafite, afterward quaffing the bubbly and the purple without showing preference for either.

As was fitting, the formal toasts were, first:

"The King"

Second:

"The Sovereigns of the Kingdoms and the Heads of the States Represented"

And third:

"The Delegates to the London Naval Conference"

These three, all proposed by Laborite Ramsay MacDonald, were drunk in the unrivaled, golden wine of the Marquis de Lur Saluces.

ARE YOU PAYING FOR THIS KIND OF WORK . . . . OR THIS?

*MAZDA
*the mark of a
research service*

LIGHTING conditions have much to do with the abilities of your employees. Good light reduces mental and physical strain. It pays to use EDISON MAZDA* Lamps, which have the tested quality that assures the *full benefit of the current consumed.*

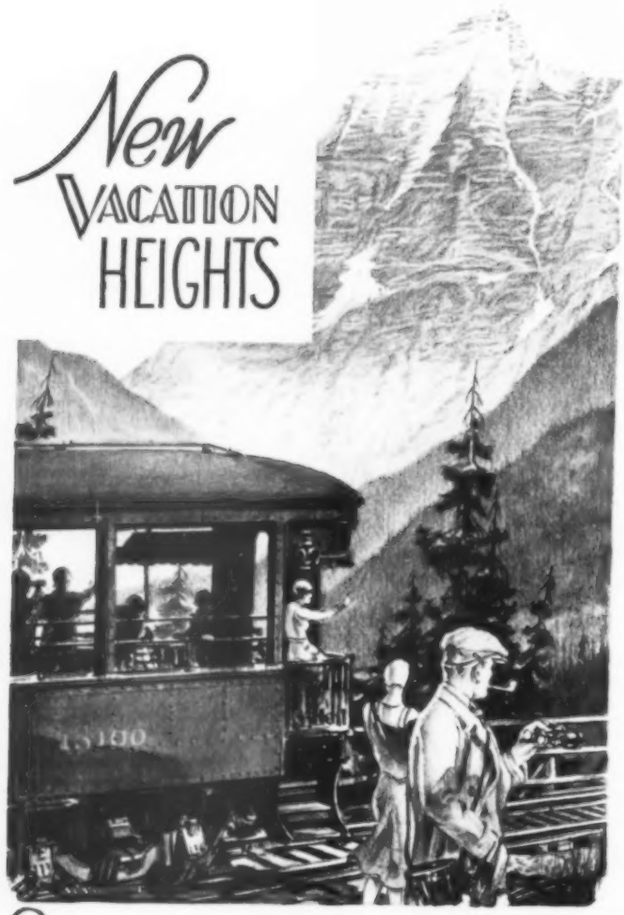
People who strain their eyes in poor light are likely to have headaches, and to become restless and despondent, with a loss of efficiency. If lighting conditions in your establishment are defective, your employees work under a disadvantage *at your expense.*

Write the Engineering Dept., Edison Lamp Works of General Electric Company, Nela Park, Cleveland, O., and we shall be glad to send you bulletins concerning proper illumination in your particular kind of business. They will cost you nothing.

EDISON MAZDA LAMPS

GENERAL ELECTRIC

CANADIAN NATIONAL—TO EVERYWHERE IN CANADA



New VACATION HEIGHTS

ON THE CANADIAN Rockies

New grandeur . . . new thrills . . . new adventure await in Canada's Rocky Mountains, the playground of the continent.

In this setting Jasper National Park offers 5300 square miles of untamed Alpine beauty. Climb peaks with Swiss guides; swing your driver on its Championship course. Motor, hike, or ride to roaring canyons and placid lakes.

The delightful informal luxury of Jasper Park Lodge with its fully-serviced log cabins is a fitting climax to each day's pleasure.

Beyond Jasper Mt. Robson, Monarch of the Rockies, and the swirling Thompson, Fraser and Skeena Rivers, call you on to the Pacific coast. Take the Jasper Park-Canadian Rockies Route through this scenic wonderland to the Pacific Coast.

Full information from any Canadian National Office

CANADIAN NATIONAL
The Largest Railway System in America

OFFICES

BOSTON 186 Tremont St. · CLEVELAND 925 Euclid Ave. · LOS ANGELES 607 So. Grand Ave. · PITTSBURGH 355 Fifth Ave. · ST. PAUL 85 East Fifth Street
BUFFALO 420 Main St. · DETROIT 1523 Washington Blvd. · MINNEAPOLIS 518 Second Ave. So. · PORTLAND, ME. Grand Trunk Ry. Sta. · SAN FRANCISCO 689 Market St.
CHICAGO 4 S. Michigan Ave. · DULUTH 430 W. Superior St. · NEW YORK 505 Fifth Ave. · PORTLAND, ORE. 302 Yamhill St. · SEATTLE 1329 Fourth Avenue
CINCINNATI 49 E. Fourth St. · KANSAS CITY 705 Walnut St. · PHILADELPHIA 1422 Chestnut St. · ST. LOUIS 314 No. Broadway · WASHINGTON, D.C. 901—15th St., N. W.

Big Ship

[*Continued from page 94*]

1,500 passengers a trip, while the British and American ships carried 700 or 800. The *Leviathan* and the *Majestic* are older because the *Bremen* and the *Ile de France* have been born.

No line, therefore, can predict that its new monster will live (socially and economically) for more than twenty years. It must depreciate the ship as fast as it can. P. W. Chapman, vigorously and rather unexpectedly entering the shipping business, paid $6,750,000 for the *Leviathan* and expects to have written it off in ten years; the projected monsters, *Leviathan II* and *Leviathan III*, will cost nearer $25,000,000, and the annual depreciation charge cannot be less than $1,000,000, although it is perfectly conceivable that the ships will be sound for a century. Add to this the ship's share of the line's general expenses, the interest charge on the investment (this varies greatly, as various governments make construction loans at various rates of interest), and it is clear that the margin of net profit is small.

Yet the monsters are essential to the modern lines, and if they actually lost money, they would in all probability continue to be built. For the big ship provides the *réclame*, the impetus which gives life to the entire line. Because of the *Leviathan's* prestige, others take passage on the *George Washington*, and shippers fill the 5,000-ton cargo space on the *President Harding*. Were there no competition, there is no question but that the United States Lines would build its entire fleet along the lines of the new 700-foot, 20-knot ships it will put into service between New York and the Channel ports. But without the *Leviathan* or its equivalent, these ships would sail with thin passenger lists. The monster is a luxury, but even more it is a necessity.

Hence the *Leviathan II* and *III*, the *Bremen* and the *Europa*, the building problems of the English lines. Granting that the North Atlantic is over-tonnaged (which means simply that there are more berths than there are passengers), the lines must not stop building. Retire the old ships, turn them into other routes as new vessels are built (and the United States Lines is in a good position to do this), or scrap them altogether, but under no circumstances lag behind in the procession. There are too many ships, but not enough good ships.

Thus the shipping men argue, and upon the correctness of their argument rests the industry's future. With the *Leviathan* as a base, the United States Lines plans to build the best fleet in the North Atlantic. With the mail contract (currently being awarded) they will have substantial Government help. They have a keen operating chief in Joseph E. Sheedy; they have the considerable advantage of running American ships from American ports. Upon them appears to devolve the next experiment in making the North Atlantic passenger trade show satisfactory returns.

Copper Considered

[*Continued from page 71*]

when War supplies were being dumped all around. Money-making based on the tremendous increase in electricity and other copper uses multiplied by a marvelous increase of efficiency in mining and especially in ore treatment.

The next decade: Unlimited possibilities for increased use of copper. Strength and maturity of organization to withstand any temporary slackness of demand and hence to reap profits when demand is normally or abnormally good.

All of which may further be summed up in an odd footnote. For several years people have been talking about how aluminum would displace copper in electricity. Coppermen now declare the aluminum threat has passed. Why? Because of the airplane and the other things such as motor busses, wherein lightness is all important or extremely attractive. While aluminum men maintain that the aluminum supply is ample and that in some fields of transmission their metal will always be supreme, coppermen believe that when enough aluminum has been produced to supply the primary needs for it, there will not be enough left for services such as electricity. Copper, in short, regards the future of electricity as its own.

NOTE THE COUPON

Complete Information About How You Can Use Business Movies To Increase Sales, Cut Traveling Expenses—Sent Without Charge For Coupon Below.

An Odd Fact About Buyers' Eyes

That Enables You To Easily Win Interviews For Your Salesmen

New-Type Business Movie Speeds Up Selling Remarkably

WOULD you like to help your men get into buyers' offices more quickly . . . get orders without loss of time and money?

Then equip each one with a film that presents your line in the same way that your star salesman employs to introduce it.

And you'll find that prospects who ordinarily close their ears are glad to open their eyes.

Why?

Simply because, like any of us, buyers *believe* their eyes, yet *distrust* their ears. That this is true, your own experience will prove.

What Your Own Experience Proves

Doubtlessly, you have often met intelligent men who refused to buy on your first, second or even third call. Of course, there was a reason.

Perhaps it was *because they did not want to let you think they were being "talked" into something.*

Courtesy Eastman Kodak Company

With a light, portable projector, your salesman is able to show your selling film right on a prospect's desk.

Or, it may have been that *since they were unable to build a clear mental picture of your product and proposition immediately, they were afraid to talk lest they betray their ignorance and so lose face in your eyes.*

Yet, as soon as they understood your line perfectly and gained more confidence in the house in back of it, they were glad to buy.

Business Movies Save Time and Money

By establishing instantly the right kind of a picture of your line in a buyer's mind, a properly constructed movie will increase the number of first call sales. By reducing the number of visits necessary to sell prospects, it will cut traveling expenses. And, since a prospect receives only the kind of impression of your firm that you want to get across, your movie will enable you to better hold business that you win.

That is what a business movie of your line will do for you—but it must be expertly made.

How A New Technique In Making Business Movies Assures Success

To successfully build in a buyer's brain a complete panorama which shows exactly what your product or proposition is and how it will prove advantageous to him, the new-type business movie reveals each picture in its proper idea-relation to the one immediately preceding.

In other words, the technique of the master salesman is the technique of making a successful business movie. It is knowing how to hook up instantly understandable ideas in picture form in a way so that when they are flashed on a screen before the buyer they travel one after the other, like freight cars going into a tunnel, through his eyes to his brain.

Pathéscope offers you just such a "star" movie of your product that not only presents your line to buyers in the same manner that you, yourself, have developed from years of experience, but with the clearness of photography, the forcefulness of logic, the persuasiveness of the action in demonstrations, and the glamour of showmanship.

Thus, the one quick way to a buyer's brain . . . the eye way . . . is easily and surely gained by this step-by-step, confidence-building picture method.

Movies Give Fresh Interest To Your Sales Story

No matter whether you are selling a service, a process, or merchandise . . . a well-planned modern movie will help boost sales.

And, when one of your salesmen sends in his card and asks to show a movie . . . he'll be invited in by the right people . . . by the ones who make decisions.

With a light, portable projector and a Pathéscope film, your representative is easily able to persuade one person or a group to buy.

A Complete Professional Service

Pathéscope is equipped to plan and produce your selling movie from scenario to finished film. Directors, trained in the specialized problems of business movie-making, work closely with clients at every step.

The cost of a film is moderate. We would be pleased to plan a scenario for you and submit an estimate. No obligation, of course.

Send Now for Complete Information FREE

THE PATHÉSCOPE CO. OF AMERICA, INC. F-AP
35 W. 42nd St., New York

Kindly send me complete information about the new-type business movie. No obligation of course.

Name .....

Company .....

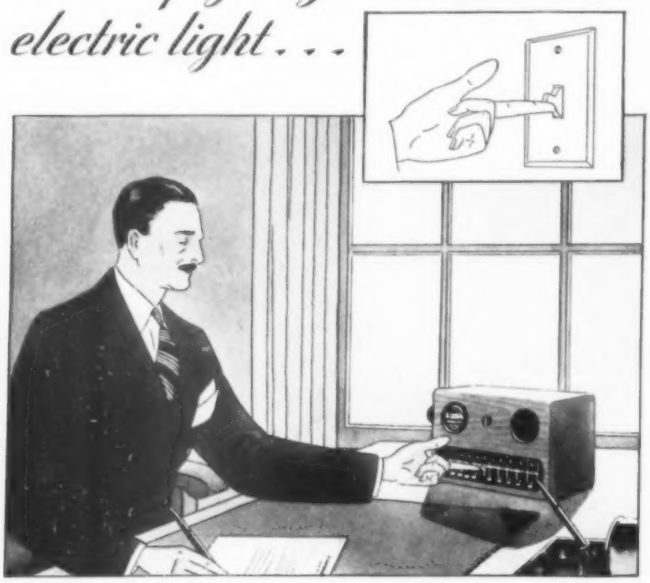
Street .....

City ..... *State* .....

THE PATHÉSCOPE CO. OF AMERICA, *Inc.*

Producers and Distributors of Business Movies: Sound, Silent and Still Picture Films

As simply as you switch on an electric light . . .



. . . YOU SWITCH ON THE VOICE OF AN INDIVIDUAL

SUPPOSE you had to 'phone for *light*—or send somebody for it—or go fetch it yourself! Unthinkable, isn't it? . . . The natural thing is to press a switch and have light instantly. »» But in your office, when you want to ask questions or issue instructions—why are you still content to 'phone for members of your staff, send somebody for them or go visit them yourself? »» Why don't you touch a switch and get your man in conversation *instantly* . . . like getting light? »» That's what the DICTOGRAPH SYSTEM OF INTERIOR TELEPHONES is for . . . to put executives into instant voice-to-voice contact with all members of the office personnel without taking any one away from his post. »» With DICTOGRAPH on your desk, you merely *flick a key and talk* . . . as simply and directly as though the other person were there beside you. A sensitive microphone picks up your words. A loud speaker brings back the answer in softly resonant, *natural* tones. You are scarcely conscious of an intervening carrier in Dictographic conversations. »» The speed of DICTOGRAPH is contagious. Office routine accelerates as time-wasting methods are discarded. And telephone service improves as the burden of "inside" calls is lifted from your switchboard and the lines are cleared for legitimate traffic, in and out. »» It will take only a few moments to show you DICTOGRAPH in actual operation on your desk, and you will be under no obligation whatever. Consult your telephone directory for our address in your city. Or write direct to DICTOGRAPH PRODUCTS COMPANY, INC., Candler Building, West 42nd Street, New York.

DICTOGRAPH SYSTEM OF INTERIOR TELEPHONES

The Modern Miracle of Business

Gillette's 800,000,000 Market

[*Continued from page 112*]

Enter the headquarters of the Gillette company in Boston, Massachusetts, at 15 West First Street. A rather depressing waiting room. White-painted steam pipes overhead. The walls are white, but from the floor five feet up they are painted brown, the kind of brown you associate with armories. Wooden benches, a nickel-in-the-slot telephone booth partly hiding a poster of a curly headed young man shaving himself. A girl at the desk under the life-size picture of King C. Gillette. Awards: "The War Department of the United States of America recognizes in this award for distinguished service the loyalty, energy, and efficiency in the performance of the War work by which Gillette Safety Razor Company aided materially in obtaining victory for the arms of the United States of America in the war with the Imperial German Government and the Imperial and Royal Austro-Hungarian Government."; "Esposizione internazionale delle industrie e del lavoro—Torino, 1911—diploma di medaglia d'oro." Many others.

• • •

A large room on the eighth floor. The shades perpetually drawn. Over each desk a shaded electric light. Be it gloomy or shiny during the eight-hour day, the testing room of the Gillette Safety Razor Company knows no difference. At each desk a girl. Perhaps five hundred in all. The room is quiet as the reading room of a public library. Except for the incessant chinking of the blades. And an occasional monotonous bell that sounded like a cowbell and rings a certain number of punctuated times to summon a supervisor. There are only three tests—visual, tactile, the hair test. But they do them over and over again. The visual: you stack the blades on a prong and look at them under the light. The trained eye will immediately detect a flaw. The tactile: run your thumb along the edges of the stacked blades—four times—once for each of the two sides of the two edges. The hair test: take a blade in your left hand, take one or two hairs from the pile in front of you, cut. If you nick the blade, it is no good and you must send it back. After the retesters become proficient, they get a bonus for every faulty blade they discover. In one corner of the room nearly a hundred girls are learning. They too, like the others, will in time become proficient, earn bonuses, have their eyes examined once every six months by one of the best oculists in Boston. A good girl, a supervisor will tell you, can inspect from 15,000 to 20,000 blades a day. The girls never speak. Some are pretty; all have silk stockings. Many applicants, the supervisor will continue, have to be turned away because they can't sit still. But the chairs are scientifically constructed to ensure the most normal and comfortable posture. No, the girls rarely cut themselves. The company has its own hospital, its staff of nurses. But they treat boils or colds or sprains. Rarely cuts.

• • •

The fundamental idea was not King Camp Gillette's but Mr. William Painter's, a friend of his. It was Mr. Painter who had procured for Mr. Gillette his position with the Baltimore Seal Company, a firm which manufactured seals for stoppering bottles (later the Crown Cork and Seal Company). One day in 1891 Mr. Painter said, "King, you are always thinking and inventing something. Why don't you try to think of something like the crown cork, which, when once used, is thrown away, and the customer keeps coming back for more—and with every additional customer you get, you are building a permanent foundation of profit." King C. Gillette thought and thought . . . until four years later, in 1895, he was shaving one morning and found the razor dull and . . . "as I stood there with the razor in my hand, my eyes resting on it as lightly as a bird settling down on its nest, the Gillette razor was born. I saw it all in a moment . . ."

The company was founded six years later, in 1901. That year and the following year no razors were sold. In 1903, 51 razors were sold and 168 blades. In 1906 the company paid its first cash dividends, $130,000. It has paid yearly dividends ever since, a total through 1929 of $73,982,430.

Mr. Gillette, although still president, is no longer very active in the company. He writes letters on anniversaries and that sort of thing, visits the plants now and again, but spends most of his time in his California home or traveling. Active head of Gillette now is shrewd, able, musical, golfing, yachting Vice President Frank J. Fahey.

Harbor Trust Building, Boston; Blackall, Clapp & Whittemore, Architects, Boston; James Stewart & Co., Builders, New York.

Gulf States Utilities Co., Beaumont, Texas; Designed & Built by Stone & Webster Engineering Corp., of Boston, Mass.

W. F. Hall Printing Co., Chicago; Weiss & Niestadt, Architects and Engineers, Chicago.

The Kellogg Company, Sydney, Australia; Designed & Built by John S. Metcalf Co., Chicago.

If the roll were called

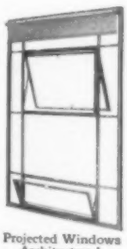
A ROLL call of Bayley installations would reveal an imposing list of buildings in outstanding industries and other prominent fields of endeavor — buildings that tower into the sky — buildings that cover several blocks — buildings that are located near and far.

It would include many of the most important and best known structures in these representative groups: Cereal Plants, Bakeries, Candy Factories, Flour Mills, Dairies, Power Houses, Water Works, Paper Mills, Railroad Shops, Printing and Publishing Plants, Airports, Public Buildings, Grain Elevators, Garages, Warehouses, Stores, Restaurants, Markets, Office Buildings, Hospitals, Libraries, Laboratories, Recreation Buildings, Apartments, Residences, Churches, Colleges.

The reasons for the growing use of Bayley Steel Windows and Steel Doors by leaders in all these groups are: a proven product and a dependable engineering service.

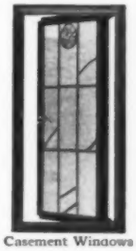
No organization has a richer background of engineering experience — no organization is actuated by higher standards — no organization strives harder to win the approval of architects, contractors and owners in the design and quality of its products.

A Bayley representative will gladly call and explain the scope and value of Bayley engineering cooperation on window and door problems. Illustrated folders on window or doors for any type of building will be mailed on request — The William Bayley Co., 148 North St., Springfield, Ohio.



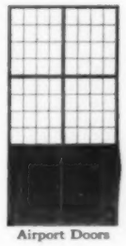
Projected Windows Architectural

Pivoted Windows



Casement Windows

Pivoted Windows Screened



Airport Doors

BAYLEY

STEEL WINDOWS & DOORS

District Offices

New York, 67 W. 44th St.
Boston, 5 Park St.
Chicago, 75 E. Wacker Drive
Cleveland, 449 Terminal Tower
Washington, 1427 I St., N. W.
Atlanta, 407 Bona Allen Bldg.
Springfield, O., North St.

Sales Agencies also in Principal Cities

after shaving
after bathing
after exercise

this famous
French formula
for the skin

For tired faces and tired bodies alike . . . *for the tiny nicks left after the razor-blade—the relaxed tissues and open pores after a hot bath —the muscles stiffened by violent or unaccustomed exercise* . . . nothing has ever been perfected quite like Pinaud's Lilac (Lilas de France).

Made from essences still compounded by Pinaud in Paris—as it has been for nearly a hundred years—this delightful toilet-water and astringent with its faint fragrances of lilacs, has been the companion of ladies and of gentlemen the world over since 1848.

Its refreshment is instant . . . its fragrance smartly unobtrusive . . . its deodorant and astringent action unfailing. *Pinaud will be delighted to send you a sample bottle for your personal use free, if you will address: Pinaud, Inc., Dept. F, 220 East 21st Street, New York.*

Pinaud
PARIS · NEW YORK

Copyright Pinaud1930

World's Record Hill

[*Continued from page 72*]

of the Panama Canal; before Jackling's army is through with the Hill, they will have shaved it to the level of the plain, taking twice as much material as was furrowed from the groove across the Isthmus and 625,000,000 more tons of copper ore.

The miners who attend to this profitable demolishment live in huts along the canyon and at the open end of the canyon in Copperton, a "model" community which the Utah Copper Company has built for its employees.

Beyond these, beside the noisy creek which is the town's open sewer, the Main Street of Bingham winds up the canyon toward the Utah Copper Company mines. It goes from the neat shacks of Copperton by a deserted smelter, a leaching plant, broken-down, solitary houses, and finally through the commotion of Bingham. In Bingham, a name properly applied to the group of houses that clings to the end of the canyon in front of the mountain, there are now churches, a Mormon meetinghouse, a Lions Club, a Kiwanis Club, movie theatres, drugstores, soda-fountains. A ramshackle, tired street, it approaches with a minimum of dignity the old mountain which its men have carved into a huge, ironic theatre. Its appearance of having suffered, in a moment of gaiety, some shiftless defeat is broken here and there by a flophouse where lights are lit and men sit with their feet on a veranda railing, or by the square spark, on the hillside or in the canyon, of a fire showing through the doorway of an isolated hut.

The bunkhouses which the Utah Copper Company provides for its miners stand far back in the hills, on the outskirts of the mines. Since the men who have come from the corners of the world to demolish the mountain do not understand each other's speech, separate houses have been built for the Chinese, the Mexicans, the Albanians, the Italians, the Japanese. Downtown, there is a messhouse for Americans and the less insistently sedentary aliens.

Because the mines are worked in night shifts as well as through the day, there is never a time at which this dark and irregular Main Street is not stirred by a shuffling somnambulant energy. The shops are closed and the married miners' houses, down the canyon at Copperton, are dark, but in Bingham, miners lean on their elbows along the counter of an all-night lunchroom, eating a midnight breakfast and talking of the work that they will finish in the dawn.

The men who live in the bunkhouses are amused by the antics of "Babe," the French wife whom Jack Kennedy, the general foreman of the Utah Copper Company, brought back with him from the War. They admire the beautiful girl who is the wife of Endow, the keeper of the Japanese bunkhouse. The man at the head of this uproarious, solitary camp is "Jed"

Cliff Bray
GENERAL MANAGER CATES, UTAH'S FIELD COMMANDER

"It's the Camel blend!"

The mild and fragrant blend of choice tobaccos makes the smoking of every Camel Cigarette a pure delight.

Camel

the better cigarette

© 1930, R. J. Reynolds Tobacco Company, Winston-Salem, N. C.

MORE REINFORCED CONCRETE DOCKS

6 *New Clients in 30 Days*

The unquestioned supremacy of Reinforced Concrete Docks and Piers is best evidenced by the character of their owners.

In January six additional outstanding dock owners adopted the FERGUSON REINFORCED CONCRETE DOCK—consistently preferred by good engineers and repeatedly upheld by the Federal Courts in point of patent protection.

READ THE ROLL CALL

U. S. Steel Corporation
American Shipbuilding Co.
Michigan Alkali Co.
Bessemer & Lake Erie Ry.
Detroit Edison Co.
Chicago & Northwestern Ry. Company
Grasselli Chemical Company
City of Detroit
Union Carbide and Carbon Co.
Solvay Process Company
Pennsylvania Railroad Co.
Canton Co. of Baltimore
Winkworth Fuel & Supply Co.
Chicago, St. Paul, M. & O. Ry. Company
Michigan Northern Power Co.
Lake Superior & Ishpeming R. R. Company
The M. A. Hanna Co.
City of Cleveland
C. & B. Transit Co.
State of California
City of Houston, Texas
Kelley Island Lime & Transport Company
Clarkson Coal and Dock Co.
Duluth and Iron Range Ry.
Buffalo Dry Dock Co.
Chicago Shipbuilding Co.
Central West Coal Co.
Bethlehem Steel Co.
Standard Oil Co. of New Jersey
Sun Shipbuilding Co.
Virginia Shipbuilding Corp.
Peerless-Egyptian Cement Co.
City of Wyandotte, Mich.
A. J. Dupuis Co., Detroit, Mich.
Michigan Steel Castings Co.
Petoskey Portland Cement Co.
Wm. Cramp & Co.
Havana Docks Corporation
City of Norfolk
Detroit Iron and Steel Co.
The Cleveland Cliffs Iron Co.
City of St. Petersburg
Gulf Refining Co.
D. & C. Navigation Co.
Anaconda Copper Co.
Houston Compress Co.
Stewart Sand Company of Kansas City
Anderson-Clayton Company of Houston
Mapes & Ferdon, Ltd.
Nicholson Terminal & Dock Co.
Staten Island Shipbuilding Co.
Imperial Tobacco Co.
Humble Oil Co.
Wisconsin Steel Co.
Edward W. Bissell Estate, Detroit, Mich.
Chester Shipbuilding & Dry Dock Company
Baltimore Dry Dock & Steamship Company
Sanford & Brooks Co. of Baltimore, Md.
Groton Iron Works Co., Groton, Conn.
Michigan Ammonia Works of Detroit
Consolidated G. & E. Co. of Baltimore.

U.S. STEEL CORPORATION
MICHIGAN ALKALI CO.
DULUTH & IRON RANGE RY.
AMERICAN SHIPBUILDING CO
BESSEMER & LAKE ERIE RY.
CLARKSON COAL & DOCK CO.

FERGUSON REINFORCED CONCRETE DOCKS

FERGUSON REINFORCED CONCRETE DOCKS

THE DOCK & TERMINAL ENGINEERING CO.
CLEVELAND — Consulting Engineers — OHIO
GAYLORD W. FEAGA, President

U.S. Newspaper Editors Look at Fortune

"Probably the largest and surely the most luxurious magazine ever dedicated solely to business. Less flippant than its irreverent elder brother TIME, FORTUNE retains the same spirit of zestful inquiry and the same unwillingness to accept popular ideas merely because they are popular. The Publishers are to be congratulated for a beautiful and vital exposition of America's specialty, her business and her industry."

Hartford Courant

"It treats industrial subjects with a wealth of artistic photographs and fine printing, precisely as if they were some precious aesthetic theme."

Baltimore Sun

"Here is certainly one of the greatest achievements in periodical printing that has ever been recorded."

N. Y. Evening World

"Should make itself felt in a field to which the most virile and productive intelligence of the world is now so largely applying itself."

Brooklyn Times

"Sumptuous to the point of rivaling the pearly gates—with its photographs, its almost lyric elaboration of the detailed process of 'disassembling' the hog, it goes Carl Sandberg one better in poeticizing the stock yards of Chicago."

N. Y. Times

"Another great success; another triumph for a publication carefully executed according to specifications drawn to fit the needs and requirements of a clearly visioned market."

Editor and Publisher

"Orchestrates in a tremendous symphony the varied strains of 'the oldest of the arts and the newest of the professions'."

Daily Princetonian

"The swankiest magazine we have ever seen—the color work makes you stand back and gasp over its reality."

Roanoke (Va.) Times

"Extraordinary publication, different from any other magazine."

Asheville (N. C.) Citizen

"Destined to take first rank among the world's greatest magazines."

Fort Wayne News Sentinel

"Difficult to think of a more brilliant example of modern American journalism. Much has been said about the glamour of America's present-day industrial civilization; much about the sheer romance of modern business but nowhere have these things been depicted more graphically than in the pages of this beautiful magazine."

Galveston (Texas) News

"Trailing the romance of big business they have not hesitated to follow the path of those who have something to sell. If they mirror an industry through the accomplishments of a single concern, their justification is that the story is an interesting one. The job has needed doing, for beauty and the business man have been strangers too long."

Christian Science Monitor

"Unique contribution to the world of business and publishing."

The (Toronto, Canada) Globe

"The Aristocrat of Business."

Boston Transcript

"The Rolls Royce of magazines. Striking originality is the keynote—as different from other monthly magazines as TIME is different from other weekly publications."

Savannah (Ga.) Press

"Admirable entertainment and much useful information for the millionaire or for any of the rest of us who can pay $1 a copy or $10 a year."

Emporia (Kansas) Gazette

"Colorful, magnificent, superb in illustrations, graphic in word portrayal—for the edification of the economic mind, for the keen delight of lovers of the artistic."

Wichita (Kansas) Beacon

"Transforms the beast of business into a prince of beauty."

Miami Herald

"A new step in magazine publishing."

Knoxville (Tenn.) Journal

"The most beautiful piece of printing to come to our desk in months. Certainly the finest bit of periodical manufacture in existence."

New Haven Journal-Courier

"Its illustrations are the best yet achieved in any magazine."

Kansas City Journal-Post

"A magnificent tribute to business. Words adequate to describe this de luxe journal of business are available but they would be regarded as gross exaggerations save by those who have examined FORTUNE."

Harrisburg (Pa.) News

"Its publishers have accomplished a notable achievement—and done it just a little too perfectly. Radicals, debunkers, philosophers, buffoons and Jeremiahs have failed; and where they have failed, the cult of the de luxe has itself accomplished a complete success in these few pages of print."

San Diego Union

TIME, INC., *Publishers of* FORTUNE *and* TIME, *the Weekly Newsmagazine*

RAW MATERIALS NOW WASTED

TWO classes of industry are especially favored by conditions that invite them to comfortable profits in Piedmont Carolinas:

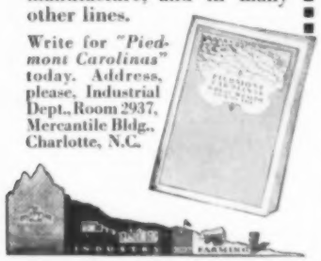
(1) An abundance of vegetable oils and cotton linters invite makers of paints and lacquers to utilize these raw materials.

The thriving Piedmont Carolinas' furniture industry and the $102 per capita building program of this region combine to offer attractive markets "at the door."

(2) Coincident to the furniture industry is a wood-waste problem that invites another branch of the chemical industry to profitable investment. Acetic acid, wood alcohol, and a dozen other products now lie tied up in waste piles of Piedmont Carolinas' furniture factories.

The facts are well worth investigating. For the bare statistics presented in this book are sufficient to point the way to many to make fortunes equal to those who have pioneered in this section in textiles, furniture, rayon manufacture, and in many other lines.

Write for *"Piedmont Carolinas"* today. Address, please, Industrial Dept., Room 2937, Mercantile Bldg., Charlotte, N.C.



DUKE POWER COMPANY

SOUTHERN PUBLIC UTILITIES COMPANY AND OTHER ALLIED INTERESTS

Shilling, whose father had the job before him. Something in his courage makes his men admire him; they speak of him with grudging respect when they are working in three shifts a day through a winter of knee-deep snow.

To live in a company flophouse, it is necessary to pay rent. To avoid this necessity, it is possible to drag an empty packing box into the hills, fit it with bunks, put a stove on the leveled earth of the floor, and buy a month's food in Bingham on the first pay day of every month. The sparks, high above the forlorn street in the canyon, are made by the fires in these houses. Greeks, Chinks, or Spics who refuse to pay a dollar for the hospitality of the flophouses of the town live in them, three or four together so they can take turns cooking and get up a game of cards in the winter without going outside.

The Bingham district, by which is meant the Utah Copper Company's Hill, produces more copper than any other district in the United States. The output of Bingham's closest rival, the Anaconda mines near Butte, Montana, is not increasing as rapidly as Bingham's is. Abroad there are two districts, one in Chile, one in Africa, which threaten the Hill's supremacy.

The Chuquicamata mines of Chile, which are believed to include the largest known body of copper in the world, have been increasing their output of copper more rapidly than Bingham's since, roughly, 1915. In Africa, in British Rhodesia and the Belgian Congo, where coffee-colored Bantus are paid twenty-four cents a day to scrape it up, the copper deposits lie close to the surface. The African ore is exceedingly rich, usually 4 or 5 per cent. No one knows how much of it there is. The four greatest enterprises in Africa are the N'Changa, the N'Kana, the Katanga, and the Roan Antelope. The four greatest mines of the world are, in the order of their annual production in short tons: Utah (Bingham), 136,912; Chile Copper (Chuquicamata), 132,932; Anaconda (Butte), 116,873; Braden (Rancagua), 109,136.

The Hill remains the most extraordinary as well as the most important of these four. In the other mines, the copper deposits are diffuse, and they are mined over a wide area with scattered shafts and separated camps. The copper in the Hill, washed to the surface by the waves of a forgotten ocean, is bound tightly together and the operations of its employment are faintly analogous to those of an old lady unwinding a ball of yarn and knitting an enchanted garment with its copper threads. The history of the Hill is now the story of copper wires carrying electricity around the earth; the chapter of its change is the story of the Utah Copper Company and of Daniel Cowan Jackling.

Mr. Grigsby Mr. Grunow

[*Continued from page 109*]

Then the whole world knew Moran and Mack and Majestic, two blackbirds and a radio.

. . .

A night fire in the finishing plant of the works broke out at the peak of Majestic production. Grunow arrived at the scene at two in the morning after a wild ride from his home. The shop, still in flames, was a sorry sight of confusion and ruin. Grunow looked glum. He had reason enough. Driving all their 12,700 employees, they were just keeping abreast of demands with a production of 6,000 sets a day. The shop foreman, who had been directing salvage work, took one look at his boss's face and made a hurried calculation on his fingers. There was comfort in his voice.

"Don't worry. We'll be able to get everything set to start production again by next Tuesday."

"Tuesday hell!" exploded Grunow. "We'll start tomorrow."

. . .

Grunow wandered every day about the plant with his eyes wide open. He came upon a young man, a new employee, whose job it was to place the last rivet on the radio "chassis." He watched him critically for a moment, then suggested a better method. The young workman lifted scornful eyes to the man in the white collar who looked like an office clerk spending his lunch hour nosing around the shops.

"Who in the devil told you to butt in?" he barked. "This is the way the foreman told me to do it, and what he says goes with me."

Grunow turned on his heel, sought the foreman.

"Say, that's a God-damned good kid you got over there."

. . .

They watched their stock fly upward on the Chicago Stock Ex-

"A quiet haven where the shattered bark harbors secure"

YEAR BY YEAR, in the same spirit that prompts them to provide for the material well-being of those who shall survive them, increasing thousands of thoughtful people are also providing inviolable and permanent sanctuary for those who shall go before them.

No haunting doubts or vain self-questionings torment the minds of those whose loving foresight has placed casket and contents beyond the reach of all external change in the protecting haven of the

GALION CRYPTORIUM
THE UNDER-GROUND MAUSOLEUM

Water cannot penetrate its steadfast walls of Armco Ingot Iron or imperishable bronze. Living organisms cannot enter. The earth itself can neither crush nor consume it. Yet the protection afforded by the Cryptorium is equalled by its beauty. The inner surface is of gold bronze, contrasting harmoniously with the rich enameled colorings of the outside. White, Tudor Silver, Antique Gold, pearl gray, lavender, or hand-embossed patterns in Baronet Bronze. The guarantee is perpetual. The cost, moderate.

Consult your local funeral director or write for leaflet 4.

THE GALION METALLIC VAULT CO.
Department FM, Galion, Ohio

GALION CRYPTORIUM
THE UNDER-GROUND MAUSOLEUM

"people aren't
INTERESTED
in your building..."

Many Advertising Experts say: "Tell them about your product... what special services you have to offer... but DON'T show your building." That's sound advice, but like the man who has just moved into a fine, new home, we take pride in showing our own new premises* ... that's human nature.

As Western printing headquarters for many organizations doing business on a national scope, we offer: A Typographic Department for advertising composition... Colour Printing, including the new Jean Berté Colour Process ... Commercial Lithography ... Steel Die and Copper Plate Engraving, and recognition by the San Francisco Stock Exchange for the manufacture of financial securities.

To business concerns and their advertising agencies Knight-Counihan offers complete and comprehensive printing service in San Francisco, the commercial metropolis of the West. Inquiries invited.

KNIGHT-COUNIHAN CO.

PRINTERS · TYPOGRAPHERS · LITHOGRAPHERS · ENGRAVERS

500 SANSOME ST., SAN FRANCISCO

* IN THIS BUILDING OUR PLANT AND OFFICES OCCUPY THE ENTIRE GROUND AND MEZZANINE FLOORS AND BASEMENT AREA

Photo by Amemya

THE SAVOY-PLAZA

Majestic and Impressive with the 840 acres of Central Park at its doors . . a setting one hardly hopes for in the towering city of stone and steel. To the travelled person, it is vividly evident that here is one of the world's distinguished hotels with the Most Beautiful Outlook in New York.

Illustrated Brochure on request

Fifth Avenue, New York, 58th to 59th Sts.

Henry A. Rost, *President*

Same Management as The Plaza

WE solicit conservative margin accounts based on purchases of stocks listed on the New York Stock Exchange. Our facilities, resources, and experience, developed through forty-one years of service to traders and investors, are placed at the disposal of individuals having satisfactory banking sponsorship.

HORNBLOWER & WEEKS

ESTABLISHED 1888

BOSTON NEW YORK CHICAGO CLEVELAND
DETROIT PROVIDENCE PORTLAND, ME. PITTSBURGH

Members of the New York, Boston, Chicago, Cleveland, Pittsburgh and Detroit Stock Exchanges and the New York Curb Exchange

WHITAKER & Co. INC.

SPORTING AND GENERAL TAILORS

666 FIFTH AVENUE
NEW YORK

AND AT 43 CONDUIT STREET LONDON W.

change. During the first ten months of 1928, the first months of their radio operations, they saw the stock, which had been worth only $25 a year before, rise from 54 to 400. In October they split it, four shares for one, and the new shares mounted to 149. But there were wide fluctuations on the board, and in the first seven months of 1929 Grigsby and Grunow saw it as low as 119 and as high as 172. They split the stock, four for one again, and in August, soon after the split-up, listed it on the New York Stock Exchange. There it reached a high of 70 before Grigsby-Grunow, along with every other stock, tumbled in the market crash. Down it came to 14¼, but even at that low figure, considering stock dividends, rights to buy more stock, and stock bonuses to officers, its value represented the phenomena of Grigsby-Grunow growth in the radio industry. Before the crash each of those little shares, worth $25 in 1927, attained a market figure of more than $1,100; and today, with little or no recovery from the crash, they are worth about $250.

The surge upward of their stock reflected a surging business behind it. Back in 1926 the company closed a fiscal year with a gross business of $2,075,590. In 1928 at their entry into the complete receiving set business, Grigsby-Grunow looked back on a fiscal year with a $5,861,225 gross business. One year later they put the finishing touches on another year which had had a gross business of $49,318,669. Undoubtedly when Mr. Grigsby showed the figures to Mr. Grunow and pointed out in his placid way that the net income for the year was over $5,000,000, both of them thought of sun-visors and $350,000 worth of pyralin turned into junk.

. . .

As the world looks at them, Mr. Grigsby stands in Mr. Grunow's shadow. Mr. Grigsby is merely a figure of finance while in Chicago Mr. Grunow is rapidly becoming a figure of legend. The best Mr. Grigsby has for romance is a financial statement and a Twelfth Night Ball attended by his good neighbors in costumes ascribed to the period of Henry VIII. Mr. Grunow is building a million-dollar mansion equipped, among other glamorous things, with an onyx marble bathtub and gold-plated pipes. Mr. Grigsby has only built a swimming pool for his neighbors' children. Mr. Grigsby has given up rabbit hunting, but Mr. Grunow keeps twelve thoroughbred horses in a plush-carpeted stable where electric radios play while the steeds merrily munch their oats. And beyond all that, Grunow's vivid wealth stands in spectacular contrast to his boyhood in the crowded German section of the Chicago west side. Mr. Grigsby had advantages. He may be said to have begun as a capitalist, for after all his father was part owner of a small brickyard in a little Illinois town. Mr. Grigsby's story is suburban tableau while Mr. Grunow's is metropolitan melodrama.

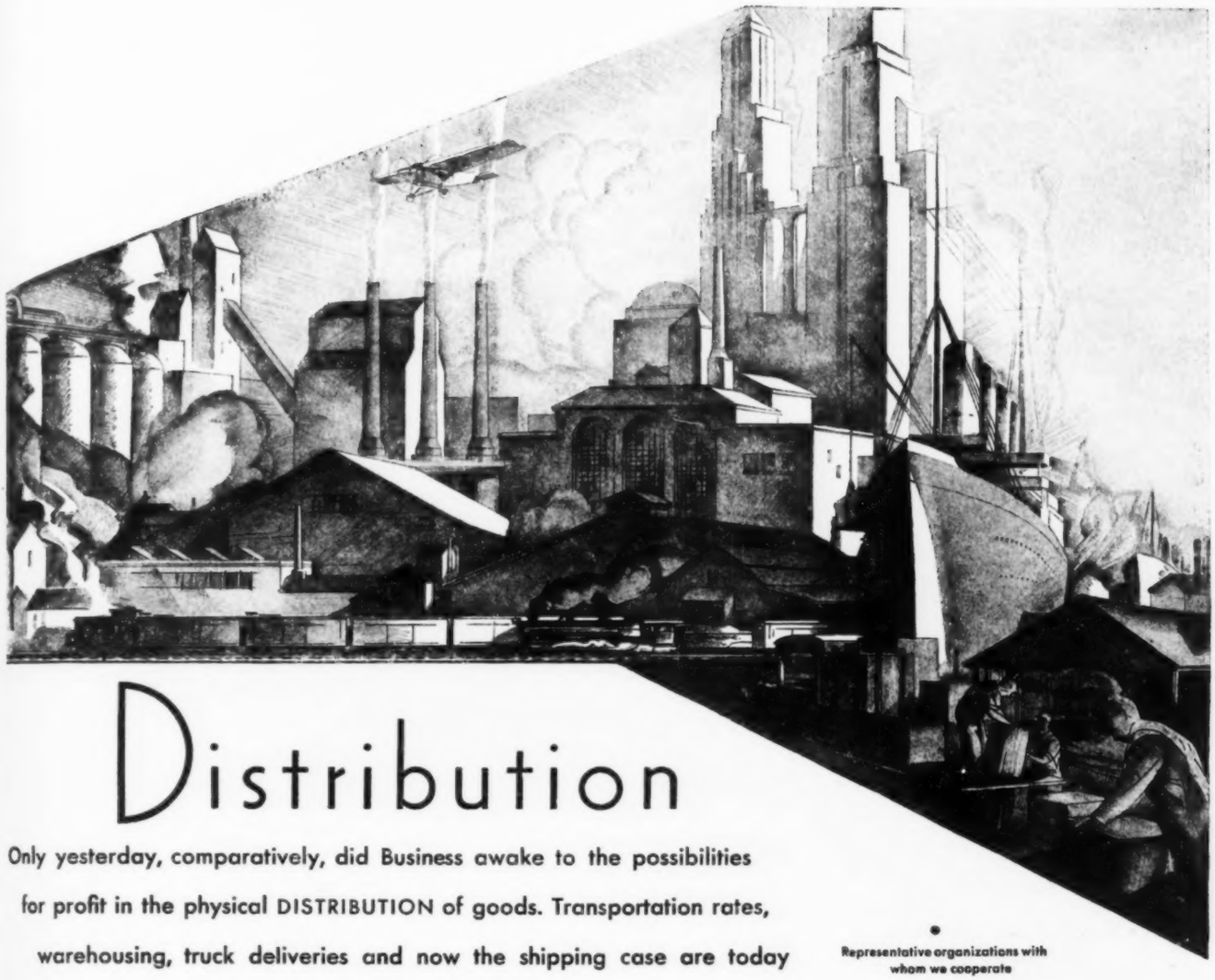
. . .

It is not enough in Mr. Grunow's opinion for the pretty bird to sing for its supper. Singing is beside the point. What the finch which graces a cage in his office must do is work for its supper, and it gets no credit for any entertainment it may have furnished in the ephemeral business of song. The bird's food is placed on a small car on an inclined plane nearly a foot away from the cage, and to bring the seed within reach the finch must pull the car by means of a string, inch by inch up the incline, using both its bill and feet. To get a drink of water, the bird must draw up a small bucket. Under Mr. Grunow's example and training, the bird has developed a love of work which it expresses by giving entirely gratuitous song to Mr. Grunow all day long while he labors for his supper and other things besides.

Mr. Grigsby does not own a bird.

MR. GRUNOW

MR. GRIGSBY



Distribution

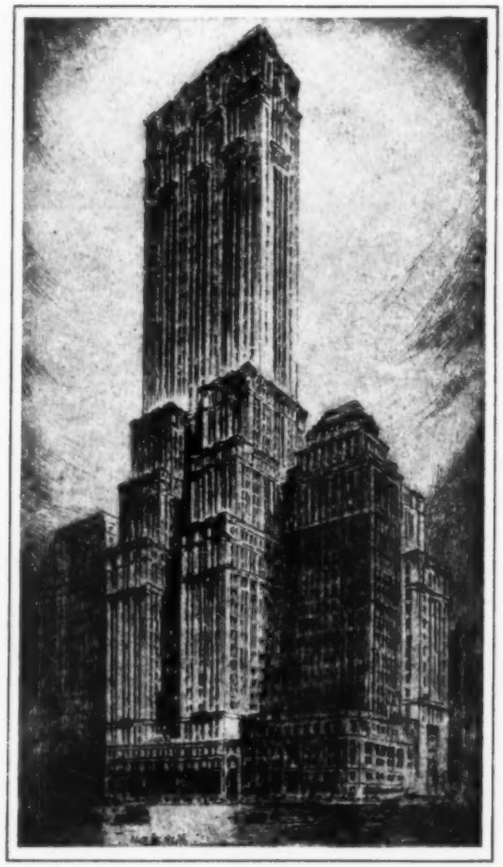
Only yesterday, comparatively, did Business awake to the possibilities for profit in the physical DISTRIBUTION of goods. Transportation rates, warehousing, truck deliveries and now the shipping case are today coming under the careful analysis of men responsible for dividends. It is now an accepted fact that the only satisfactory box or crate is the one which delivers your product safely at the LOWEST TOTAL COST. Finding it is a task for trained, experienced minds. General Box Engineers, backed by two laboratories (one in the East, one in the Middle West), will give you explicit, unbiased help with this problem. We cordially invite you to write us about reducing your shipping costs.

Representative organizations with whom we cooperate

- EATON CRANE & PIKE CO.
- E. I. DU PONT DE NEMOURS & COMPANY (Fairfield, Conn., Flint, Mich.)
- MACK TRUCKS, INC.
- THE B. F. GOODRICH COMPANY
- BYRD ANTARCTIC EXPEDITION
- NATIONAL BISCUIT COMPANY (Export)
- J. C. PENNEY COMPANY
- R. J. REYNOLDS TOBACCO COMPANY (Camels Export)

GENERAL BOX COMPANY

44 WEST ILLINOIS STREET • CHICAGO ILLINOIS



LINCOLN BUILDING
42nd Street at Madison Avenue, New York
53 Stories, 1,000,000 Sq. Ft.
Built in 275 Working Days

▲

J. E. R. Carpenter, Architect
E. J. Willingale, Kenneth B. Norton,
Wm. Harmon Beers,
Associate Architects

▲

Millions *for* Construction

Railroads, utilities, manufacturers, institutions, building owners — large and small — push programs for new construction

UNITED ENGINEERS & CONSTRUCTORS INC.

combining

The U. G. I. Contracting Co.
Public Service Production Co.
Dwight P. Robinson & Co., Inc.
Day & Zimmermann
Engineering & Construction Co.
United Engineers & Constructors (Canada) Ltd.
Dwight P. Robinson & Company of Argentina, Inc.
Dwight P. Robinson & Company of Brazil, Inc.

Design and Construct

INDUSTRIAL PLANTS
STEAM POWER STATIONS
HYDRO-ELECTRIC DEVELOPMENTS
RAILROAD WORK
GAS PLANTS

Build

APARTMENTS
HOTELS
OFFICE AND INSTITUTIONAL BUILDINGS

THIS year — like every other year — will reward low-cost operation and maintenance. Out-of-date facilities will be modernized or scrapped and replaced by new plants. Construction of this character is now being planned and projected at a rapid pace. A few of the many clients for whom we are now doing construction and engineering work are the following:

American Can Company
Buenos Aires Subway
Chesapeake & Ohio Railroad
Colgate-Rochester Divinity School
Dominion Coal Company, Ltd.
Eastern State Penitentiary (Pa.)
Girard College
Lincoln Building Corporation
Louisville & Nashville Railroad
N. Y., Rio and B. A. Air Line
National Tube Company
Pennsylvania Railroad
Pittsburgh Plate Glass Company
Rio De Janeiro Tramway, Lt. & Pwr. Co.
San Antonio Public Service Co.
St. Mark's Hospital (N. Y.)
United States Government
University of Pennsylvania
Vicksburg Bridge & Terminal Co.
Westinghouse Electric & Mfg. Co.

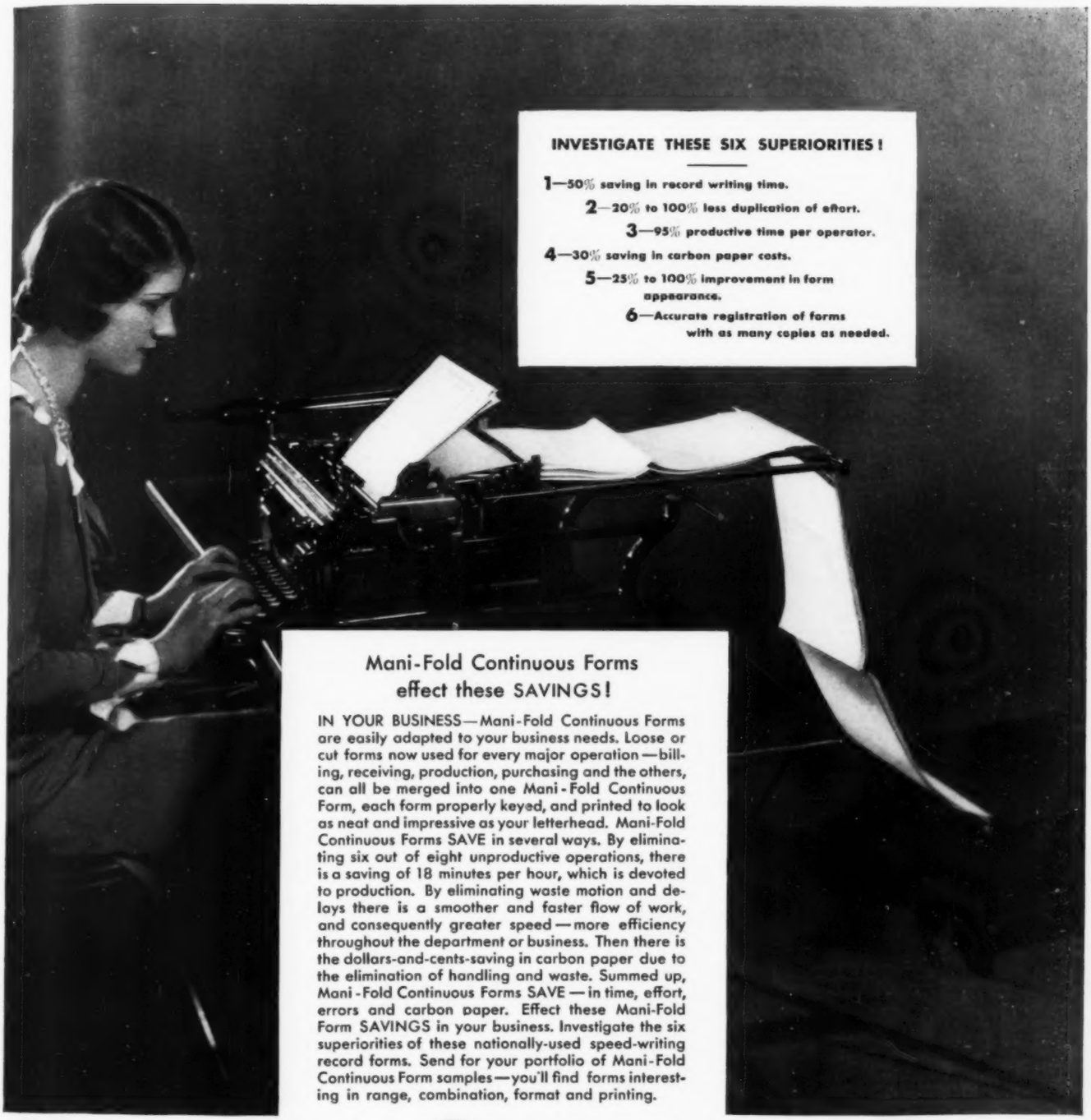
Our experience in the construction—with or without design—of industrial, power, railroad and general building work is available to those planning new facilities or extensions during the coming year.

UNITED ENGINEERS & CONSTRUCTORS
INCORPORATED

DWIGHT P. ROBINSON, PRESIDENT

PHILADELPHIA NEW YORK NEWARK CHICAGO
LOS ANGELES MONTREAL BUENOS AIRES RIO DE JANEIRO

MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED



INVESTIGATE THESE SIX SUPERIORITIES!

1—50% saving in record writing time.

2—20% to 100% less duplication of effort.

3—95% productive time per operator.

4—30% saving in carbon paper costs.

5—25% to 100% improvement in form appearance.

6—Accurate registration of forms with as many copies as needed.

Mani-Fold Continuous Forms effect these SAVINGS!

IN YOUR BUSINESS—Mani-Fold Continuous Forms are easily adapted to your business needs. Loose or cut forms now used for every major operation—billing, receiving, production, purchasing and the others, can all be merged into one Mani-Fold Continuous Form, each form properly keyed, and printed to look as neat and impressive as your letterhead. Mani-Fold Continuous Forms SAVE in several ways. By eliminating six out of eight unproductive operations, there is a saving of 18 minutes per hour, which is devoted to production. By eliminating waste motion and delays there is a smoother and faster flow of work, and consequently greater speed—more efficiency throughout the department or business. Then there is the dollars-and-cents-saving in carbon paper due to the elimination of handling and waste. Summed up, Mani-Fold Continuous Forms SAVE—in time, effort, errors and carbon paper. Effect these Mani-Fold Form SAVINGS in your business. Investigate the six superiorities of these nationally-used speed-writing record forms. Send for your portfolio of Mani-Fold Continuous Form samples—you'll find forms interesting in range, combination, format and printing.

MANI·FOLD CONTINUOUS FORMS

MANI-FOLD COMPANY (Division, United Autographic Register Co.) 13320-8 COIT ROAD, CLEVELAND, OHIO

Branch offices in all principal cities. Trade supplied in Canada by Business Systems, Ltd., Toronto

EFFECT MANI-FOLD ECONOMIES NOW!

There's no time like the present to do it! Ask your secretary to send for your copy of the Mani-Fold Sample Portfolio, by just attaching this note to your letterhead.

Underwriters and Distributors of
Government, Municipal, Railroad,
Public Utility and Industrial Securities

Investment and Brokerage Service

*Members New York and
other leading Stock Exchanges*

OTIS & CO.
Established 1899

NEW YORK CLEVELAND CHICAGO

Offices in twenty-eight cities

Tailoring to Tycoons

Accredited supremacy in the art of putting individualism into gentlemen's attire for all occasions.

Alfred Nelson Co.
Established 1888

580 FIFTH AVE. NEW YORK

U. S. Aviation Companies

ON page 85 of this issue, FORTUNE prints a partial list of the subsidiaries and affiliates of the four major groups in the aviation industry: Curtiss Wright Corp., Aviation Corp., United Aircraft & Transport Corp., and Detroit Aircraft Corp. The following is a supplementary list of companies, also incomplete.

Certain important interests in the industry are not listed here, notably the Ford Motor Co., whose Stout Metal Airplane Co. division makes the excellent Ford transport. General Motors Corp., a large stockholder in various aviation companies, is not included, nor are certain independently built planes such as the Bellancas and the Command-Aires:

AVIATION CORPORATION OF THE AMERICAS
- Pan American Airways, Inc.
  - Mexican Aviation Co.
- New York Airways, Inc.
- Peruvian Airways, Inc. (*50 per cent outstanding shares*)
- Pan American Grace Airways (*50 per cent*)

WESTERN AIR EXPRESS CORP.
- Aero Corp. of Cal.
- West Coast Air Transport
- Mid-Continent Air Express
- Standard Air Lines Inc.

CONSOLIDATED AIRCRAFT CORP.
- Fleet Aircraft Corp.
- Thomas-Morse Aircraft Corp.
- National Flying Schools, Inc.
- Kinner Airplane & Motor Corp. (*substantial block of stock in this*)
- Frontier Enterprises, Inc.
  - Niagara-from-the-Air, Inc.

FEDERAL AVIATION CORPORATION
- Washington-New York Air Lines
  - Metropolitan Air Terminals
  - Washington Airport
  - Washington Air-Terminals
- Russell Parachute Co.

ALEXANDER INDUSTRIES, INC.
- Alexander Film Co.
- Alexander Aircraft Co.
- Pyramid Film Co.

ALLIED AVIATION INDUSTRIES, INC.
- Lambert Aircraft Engine Corp.
- Mono Aircraft Co.
- Aviation Accessories Corp.
- Hurricane Aircraft Engine Co.
- Royal Airways, Inc.

ALLIED MOTOR INDUSTRIES, INC.
- Henney Motor Co.
- Van Sicklen Corp.
- Weatherproof Body Corp.
- Great Lakes Aircraft Corp.
- American Cirrus Engines, Inc.
- American Aeronautical Corp. (*Savoia seaplanes*)

ATLANTIC SEABOARD AIRWAYS, INC.
- International Airways, Inc.
  - Potomac Flying Service
  - Hoover Field
  - Haines Point Flying Service
- Gettysburg Flying Service, Inc.

AIR INVESTORS, INC.
- Comet Engine Corp.
- The Aircraft Engine Corp.
- United Aviation Corp.
- Scenic Airways
- Wyoming Airways, Inc.

AMERICAN EAGLE AIRCRAFT CORP.
- Lincoln Aircraft Co., Inc.
- Porterfield Aviation Interests

No time to look ahead

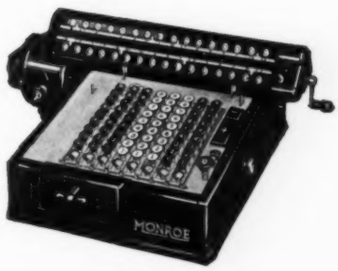
Sell this man a motor for his boat? You wouldn't have to sell him, he'd buy before your sales talk was half started. He wants to get ahead as fast as possible, to set his face towards the bow and give his whole attention to avoiding reefs and rapids in his course.

How is the course of business different? There are reefs and rapids to avoid, a port to attain—and figures are so vitally necessary that business is quick to appreciate a machine that will give prompt, accurate figures and do it so smoothly, easily and quickly that there is ample time to devote to the real job of steering the proper course.

The Monroe representative has no sales talk beyond asking you to let him study your figuring problems and tell your own clerks how to apply intelligently Monroe methods and short-cuts to your own system.

In a very few days, your routine work will be running smoother than ever. Your clerks will be producing results with first-time accuracy, and you'll be getting the additional figures you've always needed to give you a daily picture of your business.

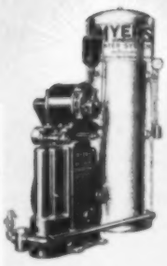
You can determine for yourself how the combined knowledge and experience of the Monroe organization, gained through its everyday contact with all types of businesses—large and small—may aid in solving your own special problems. Just telephone your local Monroe representative, or write Orange, New Jersey.



SERIES 3
MONROE ADDING-CALCULATOR
with full automatic division

MONROE
HIGH SPEED ADDING-CALCULATOR
The Machine for Every Desk

HIDDEN *BUT* IMPORTANT



RUNNING water is the most important modern convenience that you can install in your suburban or country home, farm estate, cottage, camp or club. Yet the system which furnishes it is hidden away in some out-building or basement. Insure the reliability of that system by installing a

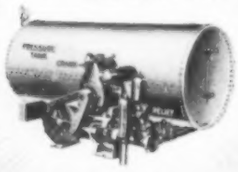
MYERS

Models to fit every required capacity and condition. Powered by electricity, gasoline, windmill or hand. Simple, safe and economical. Developed through years of experience. The tested product of "World's Headquarters for Pumps for Every Purpose."

PUMP BUILDERS SINCE 1870

Ask Myers water system experts about special requirements. Booklet on request.

THE F E MYERS & BRO. COMPANY
122 Orange St., Ashland, Ohio



The BLACKSTONE
SOUTH MICHIGAN AVENUE AND THE LAKE FRONT
CHICAGO

HOTELS *of* Distinction

THESE world-famous hotels have been individualized by impressive ideals of service, quiet dignity and a lasting congenial atmosphere.

Residential suites for long term leases available at special discounts.

Particular attention given to Banquets, Balls, and other Social Functions. Unusual facilities for Conventions at The Drake.

Write or consult C. C. Drake Company for steamship tickets, tours. Every facility for travelers. Offices in above hotels, and in The Roosevelt, New York, The Benjamin Franklin, Philadelphia, The Willard, Washington, The St. Francis, San Francisco.

The DRAKE
HOTEL *Chicago*
LAKE SHORE DRIVE AT MICHIGAN AVENUE

Wallace Aircraft, Inc.
Crescent Propeller Co.
Porterfield Flying School, Inc.

ARROW AIRCRAFT & MOTORS CORP.
Patriot Mfg. Co.

CHICAGO AIR SERVICE, INC.
Gray Goose Air Lines, Inc.
North Shore Airport Co.
Sky Harbor

There is one great cross grain running through all these concerns. It is the Bendix Aviation Corporation, and it makes the various parts that every airplane and motor manufacturer needs. The group, in part:

Delco Aviation Corp. (*Ignition System*)
Scintilla Magneto Co.
Bendix Brake
Eclipse Machine Co. [*Eclipse Aviation Corp.*] (*Starters*)
Bendix Cowdry Brake Tester Corp.
Stinson brake control mechanisms (*Manufactured by Stinson Aircraft Corp.*)
Pioneer Instrument Co.
General Instrument Corp.
J. P. Marsh Co. (Gauges and heat control appliances)
American Paulin System, Inc. (Instruments)
Tiffany Mfg. Co. (Gauges)
American Propeller Co. (*Heath propellers and adjustable and reversing mechanisms*)

SKY SPECIALTIES CORPORATION
Heywood Starter Corp.
Simon Airplane Appliance Co.

GENERAL AERO CORP.

CORD CORPORATION

NEW STANDARD AIRCRAFT CORP.

Appendix

Glossary of circus terms

Art, The	Performers
Baggage stock	Draft horses and mules
Banner	Necktie
Bennie	Overcoat
Big top	Main tent
Big tub	Bass drum
Big turkey	Ostrich
Big worm	Boa constrictor
Blues	Flat or bleacher seats
Boss windjammer	Bandmaster
Build-up, A	Publicity
Bull	Elephant
Cat	Tiger or any member of the cat family
Cherries	Balloons
Convict	Zebra
Cookhouse	Dining tent. All other tents are "tops." This one alone is a "house"
Cow	Rhinoceros or hippopotamus
Deep mit man (also leather lifter, smart-boy, and dip)	Pickpocket
Dog	Hyena, wolf, etc.
Double saw	Twenty dollar bill
Flag is up, The	Meal being served
Frying pan	Cornet
Gaffer	Boss
Geek	Snake
Gimix	A tool
Go and get it	Meal being served (Note variation from army and cattle range, "Come and get it")
Grab hair, To	To show that one is an inexperienced rider
Grifter	Confidence man, pickpocket, or short-change artist
Haul	Distance from railroad siding to lot
High-school horse	Performing horse

Cruisabout Time Is Coming!

A MONTH or two more will bring the warm, sultry, summer days and cruisabout time. Plan now to own a Cruisabout and sail away from the dust, din and danger of motor traffic. Go out on the lakes, bays and rivers where clear thoughts, fresh air and absolute freedom abound.

The three beautifully built and finished Cruisabouts with speeds of 13 to 18 miles an hour and complete living accommodations to give you every boating comfort may be had at prices ranging from $3585 to $4185.

Booklet "N-30" on request. All models on display at Bruns-Kimball & Co., Fifth Ave. and Fifteenth St., New York City

RICHARDSON BOAT COMPANY, Inc.
426 Sweeney Street North Tonawanda, N.Y.

Richardson 1930 *Cruisabouts*

SEA-LYON

SIGNIFICANT

SEA LYON comment runs as evenly as a Sea Lyon runabout. Cross currents of dispute, dissension, discussion, never even touch a Sea Lyon.

Everywhere—universally—Sea Lyon's perfect performance—Sea Lyon's complete supremacy—are consistently accepted facts.

and yet

The delivered prices of Sea Lyons are actually lower than any runabouts of similar size and power.

You will find how this is possible by writing for "Our Vanity Book" and the new Sea Lyon catalog.

6 Models $2675—$6500

HOWARD W. LYON, Inc.

HOTEL HARCLAY · 532 LEXINGTON AVE., AT 48th ST. · VANDERBILT 1145 · NEW YORK, N.Y.

Hackercraft

Leads the Quality Field in Grace and Flashing

PERFORMANCE

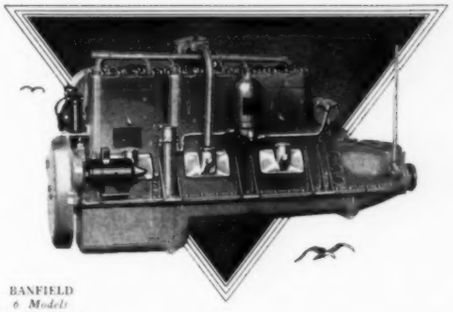
With a hull of genuine Honduras mahogany, double planked for safety, copper riveted for years of hard usage, and hand-built around a stout keel and framing of selected straight grained white oak, your Hackercraft embraces quality features seldom found in even the most expensive custom-built speed boats. Why? Because John L. Hacker, N.A., has designed more fine boats than any man in America! He has combined a positive genius for smart hull lines with a practical experience covering 36 years of boat designing and building. Performance? Just give a Hackercraft half a chance to display its riding superiority and thrilling speeds. You won't be disappointed. May we send you the new boat catalog?

HACKER BOAT COMPANY

548 RIVER DRIVE MT. CLEMENS, MICH.

HACKERCRAFT

AMERICA'S FASTEST SPEED BOATS



BANFIELD
6 Models
CHRIS-CRAFT*
6 Models
CORSAIR "16"
GAR WOOD "40"
HACKERCRAFT*
KING SEA-SKIFFS
KYLE "43"
MATTHEWS*
MINETT-SHIELDS
NORTH STAR
ROBINSON SEA GULL
(Twin Installations)
SEA LYON "40"*
STEPHENS
WHEELER "PLAYMATES"*

Foreign
BRITISH POWER BOATS
OSBORNE-CRAFT
(ENGLAND)
CLAUS-CRAFT (GERMANY)
DESPUJOLS (FRANCE)

*Optional

SCRIPPS *Powered*

The wide acceptance of SCRIPPS Motors is best expressed by the ever growing list of standardized craft offered with SCRIPPS as standard or optional equipment.

Ten models—15 to 200 Horse Power.
High speed and medium duty.

Interesting literature will be mailed upon request.

SCRIPPS MOTOR CO., 5844 LINCOLN AVENUE, DETROIT, MICH.

SCRIPPS

• THE MOTOR THAT CROSSED THE ATLANTIC •

GOOD NIGHT

The Book-Cadillac Hotel
DETROIT

Good night

If you'd ask, or if you'll listen, you'll hear folks tell great tales of the Book-Cadillac Hotel. They'll tell of beautiful, colorful, pleasant rooms for 3 and 4 and 5 dollars a day; most of them at 4. They'll tell of a kindly, friendly welcome and of young men who serve so swiftly, so quietly. You'll hear them tell of fragrant coffee and of savoury, strange and appetizing foods, by Garces, chef, incomparable. They'll tell of a lobby brave with the colors of Antoine de la Mothe Cadillac; sea blues, pennon reds, rusty golds; and of passing, constantly passing people, lean and eager adventurers on life's business. *Always* they tell of sleep, of sleeping in the softest sleepiest beds *in all the world*, in the softest and sleepiest in all the world. *Goodnight.* See you soon.

The Book-Cadillac Hotel

ON WASHINGTON BOULEVARD
THE STREET OF FINE SHOPS
DETROIT

CARL M. SNYDER — MANAGING DIRECTOR

Appendix—*Continued*

Hitch	Number of horses, e.g., a "twenty hitch" is twenty horses
Hold leather, To	(See *Grab hair*)
Hump	Camel
Joey	Clown (from Joe Grimaldi)
Jig show	Concert
Kid top	Side show tent
Kinker	Acrobat
Keester (or turkey)	Suitcase
Middle piece	Vest
Mush (also round top or shower stick)	Umbrella
Old folks	Monkeys
Pad	Fancy (but not bareback) rider
Patsy	Failure, flop
Pinhead	Negro freak
Possum gravy	Transition from one band selection to another
Punk	Young animal
Rattler	Train
Razorbacks	Crew which unloads the trains
Resinback	Bareback horse
Run	Distance from town to town
Sawbuck	Ten dollar bill
Spotted girls	Giraffes
Turnaway	Sold-out performance
Up in your lap	To rouse an audience's enthusiasm
Wet tops	Rainy weather

Note on German oil

The current development in German oil is being fostered largely by the North European Oil Corporation, although the Anglo-Persian Oil Company is also in the field. Organized by Pettigrew and Meyer, Inc., Manhattan bankers and operators in oil securities, the North European Oil Corporation has leased 1,600,000 acres in the North German Plain, the cities of Hamburg, Bremen, and Hanover forming a triangle in the approximate center of the area. Mr. Chester Narramore, formerly chief of the petroleum division of the United States Bureau of Mines, is president of North European Oil Corporation, and Dr. A. C. Veatch of New York City is consulting geologist. Mr. Henry Doherty's Cities Service Company has taken an option on 51 per cent of the stock of North European Oil Corporation, and Cities Service engineers are at present in Germany examining the leased sites.

Geologists have for many years regarded the possibility of large scale German oil production as unlikely, and Germany has always imported, and still imports, nearly all its petroleum products. On the other hand, it is undeniable that Germany has been producing oil, on a small scale, since 1859 (the same year that the first oil well was drilled in this country), and that there certainly is some petroleum in Germany's petroliferous acreage. The question would appear to be whether there is enough German oil to make Germany an important producer.

The North European Oil Corporation and others interested in the German development point out that the geologic formations are identical with those of the Mid-Continent and Gulf Coastal oil fields of the United States. More specifically, these formations include the buried salt domes which (found also in Texas and Louisiana) remain as evidences of those dried-up bodies of salt water so closely associated (see *Prospecting*) with petroleum deposits. The Germans themselves have explored some of these salt domes, but from the standpoint of mining potash, not from the standpoint of locating petroleum. They have therefore drilled only near the surface, seldom, until recently, below one thousand feet, and such oil wells as they have attempted to work have been shallow holes, clumsily drilled and inefficiently operated. Even in the United States it is only within the last few years that deep drilling has become common, so that there is some reason for discounting Germany's pre-War failure to produce petroleum in considerable amounts. Wartime Germany was of course too busy with fighting to do much drilling and a post-War German oil boom collapsed when the mark sank to the fantastically low values of its devalorization period. Hugo Stinnes had a hand in the boom, and at one time nearly a quarter of the stocks traded in at the German *börse* were oil stocks.

The Beginning of Steel Desk Standardization

Four years ago orders went into our designing and experimental departments which read "Regardless of cost, produce a steel desk that has beauty—convenience—and strength."

Two years later the desk made its appearance. It *was* beautiful. As for convenience, why just to sit with it made one feel at home. Of course, we knew from the materials used and methods of construction it had to be strong.

The atmosphere was alive with enthusiasm until the production manager said "The cost of production is prohibitive unless you can give me volume."

Then someone replied, "Make that desk in the various styles and sizes to meet present and future requirements, and all American business must give you that volume because of superior quality and value."

The plan was adopted. At that moment a Standardized Steel Desk was born.

The trade name All American naturally followed, and the *Browne-Morse Company* of *Muskegon, Michigan* is making this complete line as well as a line of All American Steel Filing Cabinets, Storage Cabinets and Filing Supplies.

Our booklet "Standardization in the Manufacture and Distribution of Steel Office Furniture" is really an interesting industrial story. May we send a copy to you?

To the EXECUTIVES Of the United States···

who either have their offices in New York City or intend making it their headquarters in the near future.

In making a final decision as to a permanent home, there are several points you should consider. The ease and speed of transportation—the community and its surroundings—the better schools and shops near at hand—the pleasures and sports offered, and the restrictions in force that will protect your home from unpleasant encroachments in the years to come.

Chilmark Park offers all of these, as well as many other important suburban advantages.

This residential park of exceptional beauty is part of a famous estate overlooking the Hudson, only 47 minutes from Grand Central Station. Its landscaped driveways winding through the hills (completely improved with water, sewer, gas and electricity), offer building sites of rare charm and individuality.

A Community Club House for the residents of the Park has recently been completed, with club rooms, bowling alleys, squash courts and locker rooms; also a large outdoor swimming pool, tennis courts and several holes of golf.

This house in the English style, of stone and stucco construction, has just been completed and ready for occupancy.

An attractive English Home recently built by its owner.

Present Offerings —Four 8 and 10 room stucco and half-timbered homes, with private garages, on approximately ½ acre plots, completely landscaped and ready for immediate occupancy. Three homes now under construction and two planned for. Also a few exceptionally choice residential sites.

Chilmark Park is carefully restricted and reserves the privilege of selecting its clientele.

Write, phone or come and see this beautiful community of better homes.

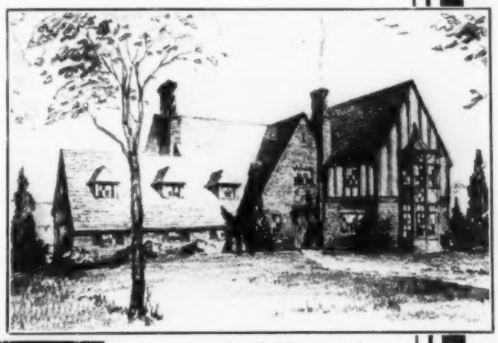
Arthur M. Holbrook, Broker, or your own broker is protected.

Chilmark Park

REALTY CORPORATION

SCARBOROUGH-ON-HUDSON
Ossining, N. Y.

TELEPHONE
Ossining 1083



A rambling English cottage of stucco, half-timber and brick, nearing completion and ready for inspection.

A Brick Colonial Home recently completed for the purchaser.

The GLEN SPRINGS

the only resort in America where the famous Nauheim treatments for the heart are given with a natural calcium chloride brine—as at Bad Nauheim itself. *Address* MR. WM. M. LEFFINGWELL, President, The Glen Springs, Watkins Glen, N.Y.

THE AMERICAN NAUHEIM

An "Island Kingdom" for Sale

off Atlantic Coast
16 miles from

Charleston, S. C.

Individually-owned domain of type so alluringly featured in February "Fortune"

Approximately 2⅝ x 1¼ miles in extent; mainly in charming natural state; fairly level, varied by dunes and fresh water ponds, and luxuriantly wooded with semi-tropical vegetation. A magnificent hard sand beach extends full length of the Ocean side. Inner side bounds the great Inland Waterway. About ½ hour from Charleston by speedboat. Nearest point on mainland 3 miles distant; convenient to Coastal Highway. Island abounds in wild duck, shore birds, deer and many other species of game; the waters in a great variety of fish.

Improvements, all recently installed, include bungalow lodge, fully furnished, with living and dining room 28′ square, 7 bedrooms, 3 baths, gun room, 9 open fireplaces; electric plant, artesian water supply; 2 staff cottages and many miles of walks and bridle paths cut through the dense growth.

Kenneth Ives & Co.

17 East 42nd Street
New York

The Long and Short of It
Means Fuel Thrift
The Burnham's long fire travel makes its short coal bill. And we can prove it. Want the proofs?
P. S.—
Send for "Letters To and Fro." It tells of eight peoples' successful solution of eight separate home heating problems. Send for it.
Burnham Boiler Corporation
IRVINGTON, NEW YORK
Representatives in principal cities of United States and Canada

Appendix—*Continued*

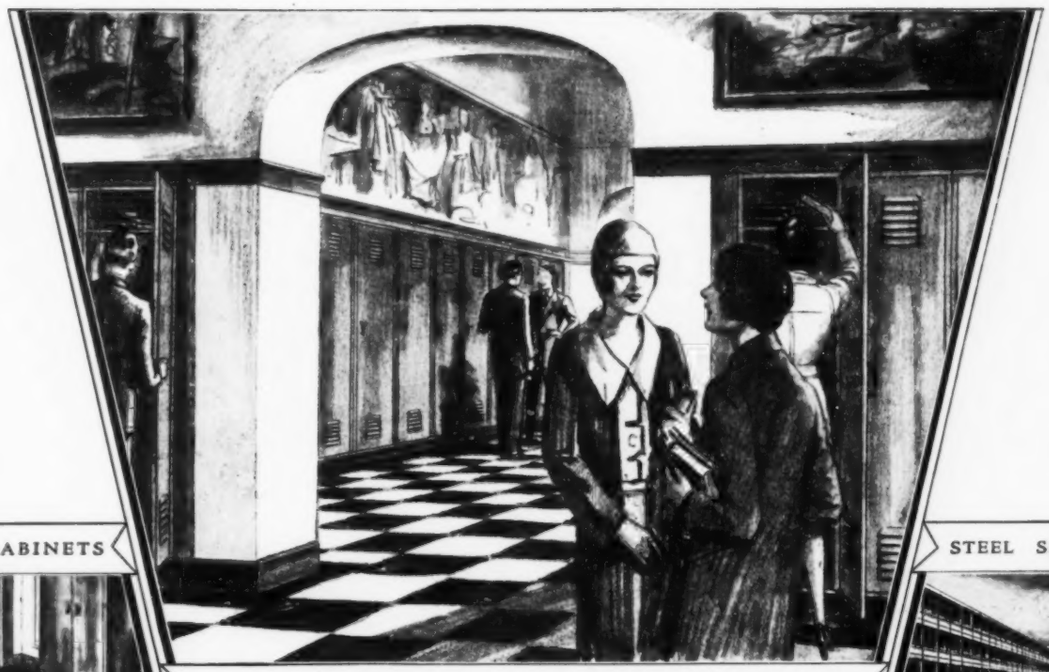
Arguing, therefore, that the presence of oil in Germany is an established fact, and that if some oil can be drawn from shallow holes, casually operated, those now interested in German petroleum are confident that the application of American drilling methods will result in substantial production. The speculative aspects of the enterprise are sufficiently obvious, and the North European Oil Corporation has thus far been a leasing rather than a drilling operation. But it is certainly true that Germany represents a petroleum surface that has hardly been scratched and that the only way to get petroleum buried six thousand or seven thousand or eight thousand feet below the surface is to go down six or seven or eight thousand feet after it.

The present German government is coöperating enthusiastically with the movement toward petroleum development, has supplied oilmen with official geological maps, and has been of the utmost assistance in the securing of legal and guaranteed leases. Such coöperation is, of course, not to be wondered at. Here, perhaps, is wealth for the young German Republic such as the old German Empire never dreamed of. Here are new riches for the impoverished Fatherland. Enthusiasts are already predicting a German oil boom comparable to the oil booms such as have successively greeted the development of each new oil-bearing section in this country. Such a development, if well founded, would obviously go a long way toward the payment of reparations, would remain as a permanent and substantial addition to Germany's national wealth.

Note on Venner

A partial list of companies whose transactions Mr. Venner has attacked.

1886	Atchison, Topeka & Santa Fe Railroad Co.
1893	American Water Works Co.
1894	Continental Trust Co.
1898	Union Pacific Railroad Co.
1899, 1900, 1905	Farmers Loan & Trust Co.
1899	Central Trust Co. of New York
1900	Pullman's Palace Car Co.
1901	Amalgamated Copper Co.
1902	United States Steel Corp.
1903	Chicago, Rock Island & Pacific Railway Co.
1904	Northern Securities Co.
1906	Wabash Railroad Co.
1906	New York Life Insurance Co.
1907	Great Northern Railway Co.
1908, 1910, 1921	Interborough Rapid Transit Co. (5 suits)
1908, 1910, 1913	Chicago City Railway Co.
1913	Southern Railway Co.
1914	New York Central & Hudson River Railroad Co.
1914, 1915, 1916, 1919	New York Central Railroad Co.
1915	Rock Island Railroad Co.
1915	Lake Shore Railroad Co.
1916	Erie Railroad Co.
1916	Pennsylvania Steel Co. of New Jersey
1916, 1917, 1918	Bethlehem Steel Corp.
1918	American Telephone & Telegraph Co.
1920, 1922	Southern Pacific Co.
1921	Guaranty Trust Co. of New York
1924	Cleveland, Cincinnati, Chicago & St. Louis Railway Co.
1925	American Hide & Leather Co.
1925	Borden Co.
1928	General Baking Co.

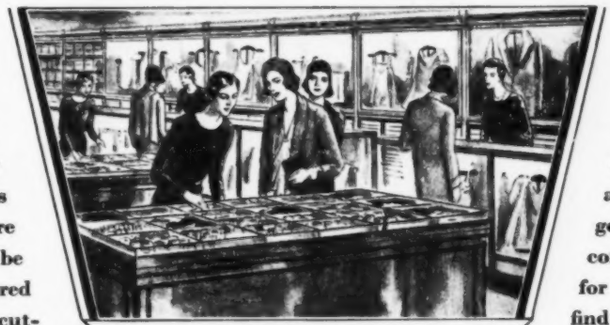


LOCKERS RECESSED FOR TRIMNESS AND SPACE SAVING

STEEL CABINETS

STEEL SHELVING

Where else can we cut costs?



RETAIL STORE EQUIPMENT

In department after department, American business men are constantly seeking to lower costs. Buying is on a more scientific basis than ever before. Manufacturing methods, sales and advertising are now geared to the disposal of mass production goods. . . . Where else, then, can economies be found? Have you considered the full possibilities for cutting costs and for sales increases in the storing, handling and displaying of goods? These costs, a large factor in any manufacturing enterprise, become of even greater importance in wholesaling and retailing. . . . To manufacturers and distributors Lyon brings the accumulated experience gained through thirty years' study of storage and display problems, and a complete line of steel equipment that saves time, space, and money. . . . Whether you need steel shelving for your stockroom, lockers for your employees, storage or wardrobe cabinet for general or private office, or complete display equipment for your retail store, you will find the help of Lyon representatives of real value, and the service of Lyon factories absolutely dependable. Write us about your specific requirements.

LYON METAL PRODUCTS, INCORPORATED
AURORA, ILLINOIS

LYON

STEEL STORAGE *and* DISPLAY EQUIPMENT

The MAGIC of the CRYSTAL ▲ ▲ ▲ brings Greater Accuracy to Industry

Product of ancient times, the Crystal was thought to have magic powers. In no other way could its discoverers explain the strange new world thus opened to their dazzled eyes.

Product of modern times, Crystal Windows of optical glass still open upon magic worlds. Through application of the principles of optics, the circle of man's knowledge is constantly being widened . . . . new fields explored . . . . new standards set.

As America's Leading Optical Institution, Bausch & Lomb brings new aids to industry. No longer is the unaided human eye the judge of what constitutes accuracy. Bausch & Lomb scientific instruments replace guesswork with a new precision, bringing standardization of product that cannot help but build prestige for the manufacturer.

May we show you the road to more business through greater accuracy?

Bausch & Lomb Optical Co. » 641 St. Paul Street » Rochester, New York
New York » » Chicago » » San Francisco » » Frankfurt a/M » » London

TO GREATER VISION THROUGH OPTICAL SCIENCE
BAUSCH & LOMB

Some B & L Industrial Products

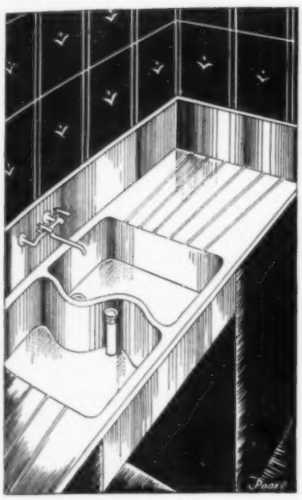
Microscopes, Colorimeters, Refractometers, Polariscopes, Saccharimeters, Magnifiers, Metallographic Apparatus, Photomicrographic Equipment, Contour Measuring Projectors, Optical Measuring Devices, etc.

Also manufacturers of

ORTHOGON
Eyeglass Lenses for Better Vision

BAUSCH & LOMB

Some peoples' servants stay . . . . .



—and other people are constantly interviewing new maids and butlers. An Elkay Butler's Pantry Sink does more than make contented servants. It brings you no end of satisfaction by making your service more prompt and efficient and inspiring more tempting dishes. It is worth while to learn the details by writing for a copy of "Butler's Pantry Sinks by Elkay."

ELKAY

4707-4717 Arthington Street
Chicago, Illinois

SW&Co
A NATIONAL ORGANIZATION FOR CONSTRUCTIVE SERVICE

Salesmen's Compensation

A helpful study of this subject will be sent to interested executives. Selling Costs, Sales Quotas, Expense Budgets, Application of Expense to Products, and Basing Pay on Profits are among points discussed.

Scovell Wellington
and Company
ACCOUNTANTS ▸ ENGINEERS
10 East 40th Street, New York City

BOSTON SPRINGFIELD · CLEVELAND SYRACUSE · CHICAGO KANSAS CITY · PHILADELPHIA SAN FRANCISCO

A
Personal Invitation
to
Hotel Hollenden

I TAKE pleasure in extending to the readers of "Fortune" a most cordial personal invitation to make The Hotel Hollenden their home when in Cleveland. Located in the heart of Cleveland's business and financial district, The Hollenden, one of the distinguished hotels of the country, offers in grateful combination, homelike comfort, luxurious surroundings, an unexcelled cuisine and an atmosphere of smartness and reasonable and uniform rates.

The famous Crystal Dining Room is a brilliant and delightful place to dine. In the "Show Boat" you will find *"a supper restaurant that is totally different"* and music by Emerson Gill and his "Show Boat" orchestra.

The Hollenden Coffee Shop is modern to the last word, with fast counter and table service for the busy man and woman.

Sincerely yours,

Theo. DeWitt
Vice Pres. & Gen. Mgr.

In Cleveland-it's The
HOLLENDEN
THEO. DE WITT,
Vice Pres. and Gen. Mgr.

---

and *ready to serve*

These efficient file pockets will change your files from a slumping, disordered mass, to a succession of erect, orderly units with indexes always visible and contents easily accessible.

No Lost Papers
No Lost Time
No Lost Space

because "Vertex" File Pockets are specially designed to eliminate these filing troubles.

We urge you to try a "Vertex" File Pocket in the place of one of those overcrowded manila folders in your own filing cabinet, and realize how your entire filing system can be instantly improved.

FREE to users of vertical filing systems, a sample "Vertex" Pocket for trial in your own files. Use the coupon below.

---------CUT HERE---------

Please send me for trial in my files a free sample of the Bushnell Paperold "VERTEX" File Pocket, as described in April, 1930, FORTUNE.

Name of Firm .....

Address .....

Name and Position of Person Inquiring .....

.....

Letter Size or Legal Size Desired? .....

To ALVAH BUSHNELL CO., Dept. F,
13th & Wood Streets Philadelphia, Pa.

TIME

That Precious, Record-breaking Flyer

If it were possible for Modern Accountancy to check up *Time lost* in any single industry; and to value that Time on the basis of Time profitably employed, the result would mean... *What wouldn't it mean?*

Time is the rawest of all factors in Business; and yet the most possible of profitable refinement. What is made of it is a matter of individual capacity. *Management* is Time's alchemist. With its human chemicals of mind, of vision, Management sees the hidden opportunity in the rough minutes as they come—takes it as they pass—and strings their flight into precious hours of service.

Modern Accountancy performs no magic with Time. It works only with the cold, hard facts and figures. But it works in the light of the needs of industry *today*—a light which reveals, perhaps more clearly than anything else, *the value of Time!*

ERNST & ERNST

ACCOUNTANTS AND AUDITORS
SYSTEM SERVICE

AKRON	GRAND RAPIDS	PORTLAND, ME.
ATLANTA	HOUSTON	PROVIDENCE
BALTIMORE	HUNTINGTON, W. VA.	READING
BIRMINGHAM	INDIANAPOLIS	RICHMOND
BOSTON	JACKSON, MISS.	ROCHESTER
BUFFALO	KALAMAZOO	ST. LOUIS
CANTON	KANSAS CITY	ST. PAUL
CHICAGO	LOS ANGELES	SAN ANTONIO
CINCINNATI	LOUISVILLE	SAN FRANCISCO
CLEVELAND	MEMPHIS	SEATTLE
COLUMBUS	MIAMI	TAMPA
DALLAS	MILWAUKEE	TOLEDO
DAVENPORT	MINNEAPOLIS	TULSA
DAYTON	NEW ORLEANS	WACO
DENVER	NEW YORK	WASHINGTON
DETROIT	OMAHA	WHEELING
ERIE	PHILADELPHIA	WILMINGTON, DEL.
FORT WAYNE	PITTSBURGH	WINSTON-SALEM
FORT WORTH		YOUNGSTOWN

Index of Advertisers

April 1930

	PAGE
Aetna Life Insurance Co.	28
Aluminum Co. of America	114
American Multigraph Sales Co.	121
American Writing Paper Co.	119
Austin Co.	107
Bausch & Lomb Optical Co.	152
Bayley Co., Wm.	133
Book-Cadillac Hotel	148
Brooks Brothers	116
Browne-Morse Co.	148
Bryant Heater & Mfg. Co.	13
Buhl Aircraft Corp.	20
Bushell Co., Alvah	153
Burnham Boiler Corp.	150
Cadillac Motor Car Co.	24
Californians, Inc.	3
Campbell-Ewald Co.	2
Canadian National Railways	130
Canadian Pacific Railway Co.	16
Carrier Engineering Corp.	155
Central Mfrs. Mutual Ins. Co.	156
Chilmark Park Realty Corp.	149
Cowan & Dengler	27
Crane & Co.	126
Criswell Publishing Co.	111
Curtiss-Wright Sales Corp.	1
Davey Tree Expert Co.	22
Detroit Aircraft	18
Dick Co., A. B.	11
Dictograph Products Corp.	132
Dock & Terminal Engineering Co.	136
Dodge Boat Works, Inc., Horace E.	4th Cov.
Dodson, Joseph H.	154
Drake, The	146
Duke Power Co.	138
Elkay Mfg. Co.	153
Ernst & Ernst	154
Field & Co., Marshall	9
Firestone Tire & Rubber Co.	5
First National Bank of Boston	103
Fokker Aircraft Corp.	33
French Line	120
Gallon Metallic Vault	138
General Box Co.	141
General Electric	129
Glen Springs, The	149
Goodyear Tire & Rubber Co.	34-35
Gruen Watchmakers Guild	14
Guardian Trust Co.	29
Hacker Boat Co.	147
Hartford Fire Ins. Co.	123
Hercules Power Co.	154
Hollenden, Hotel	153
Hornblower & Weeks	140
International Merc. Marine	122
Isotta Motors, Inc.	7
John Hancock Mutual Life Ins.	154
Kenneth Ives Co.	149
Knight-Counihan Co.	139
Lyon, Inc., Howard W.	147
Lyon Metal Products, Inc.	151
McCann Co., H. K.	4
Manifold Co.	143
Marmon Motor Car Co.	3rd Cov.
Meredith Publishing Co.	29
Mohawk Carpet Mills	19
Monroe Calculating Machine Co.	145
Myers & Bros. Co., F. E.	146
Nelson, Alfred	144
New York Trust Co.	26
Norton Co.	25
Otis & Co.	144
Packard Motor Car Co.	36
Pathescope Co. of America	131
Pierce-Arrow Motor Car Co.	15
Pinaud, Inc.	134
Pusey & Jones	30
Remington-Rand	124-125
Reynolds, R. J.	135
Richardson Boat Co.	147
Savoy Plaza	139
Scovell-Wellington & Co.	152
Scripps Motor Co.	147
Seiberling Rubber Co.	118
Smith & Sons Boat Co., Chris.	32
Stirling & Co., J. E.	7
Spartan Aircraft Co.	21
Sterling Engine	6
Texas Co.	2nd Cov.
Thompson Co., J. Walter	117
Tripler, F. R.	12
United Engineers & Constructors	142
United States Lines	17
United States Radiator Corp.	23
United States Rubber Co.	113
Vermont Marble Co.	8
Westinghouse Electric & Mfg. Co.	105
Whitaker & Co., Inc.	140
White Co.	127
Wholey, William F.	108
Wood, Gar	31
Young & Rubicam	97

Ah! A BIRD SANCTUARY

Birds add untold interest and pleasure to any grounds or estate. Learn how to attract only beneficial song birds who thank you not only with cheery songs, but by destroying harmful insects, moths and mosquitoes. A Martin colony, for instance, will keep your premises free from mosquitoes and other flying insect pests.

JOSEPH H. DODSON, America's foremost bird authority, has supervised the building of bird sanctuaries for prominent people like Henry Ford, John D. Rockefeller, Thomas Edison, Harvey Firestone, Drs. Mayo and others as well as country clubs such as Westchester Biltmore, Olympia Fields, Onwentsia, etc.

He will be glad to hear from any home owner interested in helping preserve America's song birds and to confer personally regarding the construction of a sanctuary or the proper location of bird houses on your property. Even a small garden can be made a haven for our beautiful birds. Write Mr. Dodson today as you should have your houses ready for the birds when they come with the first warm spring days.

Joseph H. Dodson

JOSEPH H. DODSON, INC.
239 Harrison St., Kankakee, Ill.
"Bird Lodge"
A Book Will Be Sent to Those Interested — "Your Bird Friends and How to Win Them."

Fortune

SUBSCRIPTION DEPARTMENT
350 East 22nd Street, Chicago, Illinois.

Enter my Subscription for FORTUNE for one year and send me a bill for $10.

Name .....

Address .....

.....

YOU SHOULD KNOW MORE ABOUT THIS FINISHING MATERIAL

New uses are constantly discovered for nitrocellulose lacquer. It dries so quickly that it is saving fortunes in time and storage space. It forms a tough film that is highly resistant to abrasion. ¶This durable, protective film is waterproof and can be readily cleaned. It is applicable to wood, metal, plaster, textiles, and other surfaces. Containers are sealed with it, and the attractiveness of many articles is enhanced by its beautiful colors. ¶Please write us for a booklet, *"The Story of Modern Lacquer,"* and consult the firm that makes your finishing materials. Nitrocellulose lacquer is sold by the paint, varnish, and lacquer manufacturers. »

CELLULOSE PRODUCTS DEPT.
HERCULES POWDER CO.
(INCORPORATED)
975 King Street, Wilmington, Delaware
Nitrocellulose — Explosives
Cotton Cellulose — Naval Stores

JOHN HANCOCK SERIES

Real Coöperation in a Practical Way

THE best way to develop coöperation between employer and employee is through Group Insurance, based on the coöperative effort and cost-sharing of both.

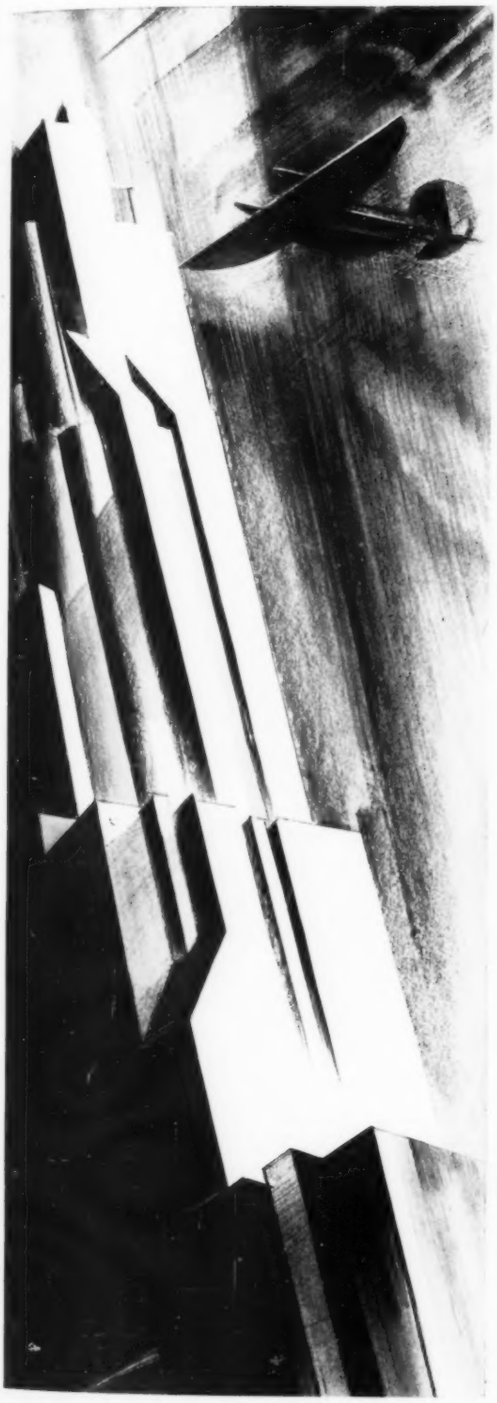
Today there are more than 6 Million lives protected by approximately 9 Billion dollars in Group Insurance.

If you have not yet solved *your* employee problem the Group Insurance way, you will find our booklet, "Management, Men and Motives," of interest. We shall be glad to send you a copy.

John Hancock
LIFE INSURANCE COMPANY
OF BOSTON, MASSACHUSETTS

FR. *Over Sixty-seven Years in Business*

Buildings still in Blue-Print *may be* OBSOLETE



UNLESS THEY PLAN TO MANUFACTURE THEIR OWN WEATHER

"WHY are they pulling that handsome building down?" you've heard passers-by ask. "Every year buildings are wrecked that were made to last much longer."

The answer is "obsolete."

The space will not rent at a profit. The building is not "modern." Some of these buildings become obsolete sooner than others because they cannot offer the comfort, the efficiency, the value that tenants have learned to expect.

Manufactured Weather will change this. It will make any building outstanding while new. It will prolong the time during which the building will command profitable rentals and hold desirable tenants.

Manufactured Weather brings within four walls the weather that nature makes only on those rare, perfect days that poets sing about.

Outdoors the weather may climb to the humid nineties . . . yet indoors it can be cool and free of uncomfortable humidity.

Outdoors it may be Arctic cold . . . yet indoors properly humidified, warmed air is circulated, bringing new winter comfort. All air is washed clean of outdoor impurities. Windows need never be opened for ventilation. Street noises and dirt are kept out. The most remote inside space will be as comfortable as the president's corner. Leading architects and engineers are now suggesting Manufactured Weather for all important buildings and advising their clients that failure to look ahead to the general use of Manufactured Weather as standard practice is certain to contribute to an early obsolescence.

The Brookmire Economic Service in a recent bulletin says, ". . . New developments which will tend to make old buildings obsolete . . . include improvements in building equipment, such as air conditioning and year-round temperature control."

More and more, Manufactured Weather is being adopted for both old and new buildings.

Congress has it; Macy's in New York has it; a dozen other famous department stores have it too.

Hundreds of factories have it. Sheer manufacturing economy has dictated that indoor air conditions must be constant and controllable.

If you would like to know more about Manufactured Weather for your own building or store or factory, ask us to send you an engineer who will discuss your individual requirements without obligation to you.

There is only one Manufactured Weather. It is the product of Willis H. Carrier and his associates.

Carrier Engineering Corporation

NEWARK, NEW JERSEY

OFFICES: NEW YORK . PHILADELPHIA . BOSTON . CHICAGO . CLEVELAND
WASHINGTON . DETROIT . KANSAS CITY . DALLAS . LOS ANGELES

Manufactured Weather *makes* "Every day a *good* day"

CARRIER ENGINEERING COMPANY, LTD
LONDON, PARIS, BOMBAY, CALCUTTA
JOHANNESBURG

CARRIER LUFTTECHNISCHE GESELLSCHAFT
STUTTGART, BERLIN

Unexpected Visitors Crashing in from the Skies

Something to think about! . . . While the safety factor is constantly becoming greater, the fact cannot be ignored that wherever machines are flying, there is the ever-present danger of a plane crashing into your home or your business property. A new CENTRAL Aircraft Policy is designed especially to protect property-owners against loss from crash or fire damage resulting from such an accident.

Since its founding in 1876—over half a century ago—CENTRAL has always enjoyed a reputation for conscientious service, fair adjustments and prompt payment of losses. Its stability is unquestioned; policies absolutely safe. It is a conservatively-managed mutual company, returning a dividend which for the last nine years has represented an actual saving to policy-holders, of 30% in insurance cost.

Significant Figures from Financial Statement of January 1, 1930

Total insurance in force	$395,247,955.00
Total assets	4,184,607.00
Cash surplus	1,951,815.00
Losses paid in 1929	1,143,694.00
Losses paid from organization to January 1, 1930	13,676,710.00
Dividends paid in 1929	826,001.00
Dividends paid from organization to January 1, 1930	6,856,196.00

"An old line, legal reserve, dividend paying mutual fire company."

For Fire, Automobile, Tornado or Aircraft Insurance, CENTRAL policies command the interest of every careful buyer of insurance protection. All policies written through local CENTRAL agents. There is probably one in your territory. Full information, with name of nearest representative, on request.

Organized 1876 — *The* CENTRAL — *A Friendly Company*

MANUFACTURERS MUTUAL INSURANCE COMPANY
VAN WERT, OHIO

FIRE, AUTOMOBILE AND TORNADO INSURANCE FOR SELECT RISKS